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City of Cambridge.

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THE

MAYOR'S ADDRESS

AT THE

Organization of the City Government,

AND THE

ANNUAL REPORTS

MADE TO

THE CITY COUNCIL.

BOSTON:
PRINTED BY MACDONALD & SONS,
11 Chardon Street.
1877.

CITY OF CAMBRIDGE.

In Common Council, Jan. 3, 1877.

Ordered, That twelve hundred copies of the Mayor's Inaugural Address, together with the Annual Report of the Committee on Finance, made to the last City Council, with the accompanying documents, and such other documents as have been ordered to be printed by the City Council, be printed under the supervision of the City Clerk, and under the direction of the Committee on Printing, for general distribution, as speedily as possible.

Sent up for concurrence.

Attest: JOHN McDUFFIE, *Clerk pro tempore.*

In Board of Aldermen, Jan. 3, 1877.

Concurred.

Attest: JUSTIN A. JACOBS, *City Clerk.*

Jan. 4, 1877.

Approved

FRANK A. ALLEN, *Mayor.*

ADDRESS

OF

HON. FRANK A. ALLEN,

MAYOR.

Gentlemen of the City Council, —

We are assembled to-day as the representatives of the people of this city, selected by them, under the provisions of our charter, to administer their municipal affairs during the ensuing year. In accepting this trust, we are actuated, I am sure, by one common desire to perform the duties assigned to us in such a manner as shall command the approval of our fellow-citizens. By the divine help of Him whose name we have invoked, let us endeavor to understand, and faithfully to discharge, every obligation which may devolve upon us.

For myself, I desire to express my grateful acknowledgment to the people of Cambridge for the high civic honor they have conferred upon me. With a limited experience in public affairs, I can but distrust my ability to fulfil the requirements of the position to which I am called. I can only say that I will do all in my power to secure an upright and pure administration.

Your duties, gentlemen, will be arduous, and often embarrassing; but, that they will be cheerfully and diligently performed at all times, I have no doubt. It will be my pleasure to do all I can to lighten your labors, and to render them agreeable to you. To this end I shall rely upon your regular and punctual attendance at all our meetings, so that public business may be disposed of without unnecessary delay. Some of you, coming here for the first time, may have supposed that the new duties which you have assumed would simply require your presence at the regular meetings of the branch of the City Council to which you are assigned. But this is not all. Your most important work will be in the committee-room. To facilitate the business of the City Council, its work is largely divided among committees, to which the various subjects requiring action are allotted. The care of the different departments of the government, and the details of their operations and requirements, are submitted to such committees; and to them the Council must look for information concerning the matters placed in their charge. To them also is intrusted, to a large extent, the purchase of all materials and supplies. You will thus see that upon the faithful manner in which you discharge your duties in committee — involving prompt and regular attendance, and a constant, watchful care, with the closest scrutiny into proposed expenditures — must depend, in a great measure, the character of our administration for economy or extravagance.

FINANCES.

I will now give you a brief statement of the financial condition of the city as presented by the books of the Treasurer, and will call your attention to some of the more important branches of the government which you will be called upon to direct and control during the year. Full details may be found in the reports presented by the heads of the various departments. A careful perusal of these reports will give you a better understanding of what has been accomplished during the past year, and of the things which should be done, and those which should be left undone, by you, than I can be expected to give within the limits of this address. I cannot too strongly urge upon you all the importance of examining these reports with great care; and I would impress this particularly upon those newly called to the responsibilities which are about to devolve upon you.

Under the operation of the Act of the Legislature in relation to sinking-funds for the liquidation of municipal indebtedness, and of our ordinance based upon that Act, the City Council must raise by taxation every year, in addition to the interest, a sum equal to eight per cent on all outstanding ten-year loans, three per cent on all twenty-year loans, and one and one-half per cent on all thirty-year loans that were negotiated since March 20, 1872, and the sum of $10,000.00, annually, on all loans made previous to that date. These several sums are placed in the hands of the Board of Commissioners of

Sinking-Funds. The value of the funds in their hands Nov. 30, 1876, was $531,945.85; which, with the annual additions from taxation, and the accumulations from interest on the fund as invested by them, will provide means for redeeming the various loans as they become due.

The total debt of the city, Nov. 20, 1876, is shown by the following exhibit: —

Note of the City		$30,000.00	
City Bonds		3,186,000.00	
			$3,216,000.00
Trust Funds	Daniel White Charity	$5,000.00	
	Dowse Institute	10,000.00	
	Sanders Temperance Fund	10,000.00	
			25,000.00
State and County Tax			84,426.47
Unpaid Approved Bills			3,883.08
Unpaid Interest, due			565.00
Water Loan			1,500,300.00
Gross Amount of Outstanding Debts			$4,830,174.55

Towards the payment of this debt there was, Nov. 30, 1876, in the hands of the

Commissioners of the Sinking-Funds of the city (not including the premium — $14,080.00 — paid on securities purchased for investment of the funds, as has been the custom heretofore)	$531,945.85
Trustees of the Sinking-Funds of the Cambridge Water-Works, June 30, 1876	179,441.33
City Treasurer, cash	27,157.58
	$738,544.76
Leaving the total *net* debt of the city, Nov. 30, 1876,	$4,091,629.79

The net debt of the city, Nov. 30, 1875, was $3,986,-163.96; from which it appears that the net debt was increased during the past year by the amount of $105,-465.83. Of this sum $58,240.38 was added to the Water Debt, and $47,225.45 to the general City Debt. The increase in the Water Debt was largely due to the employment of destitute laboring-men under orders of the City Council. The increase of the general Municipal Debt is more than accounted for by the amount paid for estates surrendered on account of low land filling, and the reduced value of the sinking-funds, resulting from the new method of computation adopted by the commissioners.

To arrive at the actual condition of our Municipal Debt, there should be deducted, from the total amount outstanding, that portion which was created for the cost of the Water-Works. The income annually received from the Water-Works will, it is estimated, prove sufficient to pay all current expenses of the works, including care, repairs, supplies, &c., as well as the interest on the entire amount of the Water Loan, and a sufficient sum to the Trustees of the Sinking-Fund to extinguish the debt as it matures. Therefore, as the debt contracted on account of the Water-Works adds nothing to the burden of taxation, it should not be considered a part of the City Debt proper.

Deducting the Water Loans from the net amount of debt, as before stated, we have as

The real Municipal Debt, Nov. 30, 1876, for which provision must be made by taxation $2,770,771.12

To pay the interest, and provide for the sinking-funds upon this portion of the debt, there must be raised by taxation this year the sum of $188,162.50 for interest, and $155,265.00 for the sinking-fund, making a total of $343,427.50, equal to more than $5.50 per thousand on the valuation of the city, as determined last year.

When to this large amount, with which we find ourselves already burdened, are added the sums necessary to be raised for our Schools, Almshouse, Fire Department, Streets, Police, and other current expenses, it will be seen that the rate of taxation, on a probably diminished valuation, can show but little reduction without an increase of the City Debt, which should be jealously guarded against.

The amount of taxes assessed for City, State, and County purposes last year, was $1,033,117.60, of which there was collected, and paid into the city treasury, previous to Dec. 1, 1876, the sum of $814,175.29. The amount of abatements made by the Assessors was $17,-619.44, and of discounts allowed by the Collector on taxes paid before Oct. 10, $32,822.86 ; leaving a balance of $168,500.01 unpaid at the close of the financial year. This amount of uncollected taxes is larger by $61,179.95 than for any previous year, except 1875. No more striking evidence of the depressed condition of affairs can be presented than the fact just stated.

To avoid an increase in the rate of taxation, or, what is still more desirable, to effect a reduction in the rate, without adding to the volume of indebtedness, will require

at our hands a careful examination of every proposed expenditure. Improvements which are not shown to be of immediate necessity must be postponed, and all supplies and materials needed must be purchased at the lowest market-rates. In fact, while the actual wants and true welfare of the city should not be neglected by a false system of retrenchment, a genuine spirit of economy must prevail in every department of the government.

ALMSHOUSE.

The next subject to which I wish to call your attention, and one which I deem of the greatest importance, is the management of the Almshouse, and the support of the poor, both in and out of the house. The expense of this department has risen from $28,168.72, in 1866, to $85,469.73 in the year just ended. Of this amount, $34,552.15 has been required to meet the direct expenses of the Almshouse, including $6,992.06 for collection of house offal. The remainder, $50,917.58, has been expended for outside aid. The latter sum includes $7,624.93 paid to State institutions for the support of insane persons and others, and also $3,914.92 paid to other cities and towns for aid to those residing in such cities and towns who had a settlement in this city. The number of those who have received aid from the Board of Overseers during the past year is nearly six thousand, — a suggestive fact.

It may be urged, that by reason of the changes in the law of settlements, as well as from other causes which have been operative during the last ten years, the num-

ber of persons needing assistance, and entitled to receive it, has largely increased; but this, in my judgment, does not fairly account for this great increase in expenditure. Without reflecting upon those who have been engaged in the arduous duty of disbursing the money of the city, I propose to point out what I consider some of the defects of the system which has been so long followed, and to suggest for your careful consideration some plan by which the existing evils may be remedied, and a large annual saving be made, without doing injustice to any of the poor whom we are bound to support, and whom we may lawfully support at the expense of the city.

In the first place, the actual condition of every applicant for assistance should be ascertained, and the question of his settlement, or want of settlement, determined. This would require the visiting of the persons applying for assistance, and a careful inquiry into their circumstances, their antecedents, and prospects. The determination of the question of settlement would require a careful examination of the tax-lists here, and perhaps elsewhere, entailing, oftentimes, inquiries into genealogies, and the settlements of the ancestors of the parties seeking aid. The more carefully and accurately this is done, the greater the saving to the city. Complete records should be kept of all the facts so ascertained, as well for future use as at the moment when needed.

It must be evident that this amount of labor cannot be expected from a Board of Overseers elected upon a general ticket, who give their services to the city without compensation, and who are actively engaged in private pursuits.

To carry these suggestions into effect, some method should be devised to bring this matter more directly under the control of the City Council. If the city charter were so amended as to provide for the election of a Board of Overseers by the City Council, to consist of three members, to hold office for three years, one of whom should be elected annually, and if this Board were authorized to appoint as their agent a man of first-rate ability, who should be constantly employed as visitor and agent of the Board, and who should receive a liberal salary, the duty of providing for the support of the poor could be intelligently and faithfully performed, with, I believe, a saving of thousands of dollars to the city. I earnestly invite your attention to this subject, in the hope that measures may be taken, as speedily as possible, to give to the management of our Poor Department more of system and efficiency than can be claimed for it at present, and in the belief that a considerable saving may be made without injustice to those who are entitled to receive assistance.

WATER-WORKS.

This I also consider one of the most important interests belonging to our city. It is intimately connected with the personal welfare and comfort of almost every individual within our borders. Having been a member of the Water Board during the past year, I am enabled to speak from personal knowledge of its affairs and condition.

Financial Standing.

The Total Cost of the Water-Works, Nov. 30, 1875, we find to have been, per Last Year's Report . . .		$1,552,567.20
Expended for Extension Account during the Year ending Nov. 30, 1876		104,143.11
Making the Total Cost of the Works as made up to Nov. 30, 1876, to be		$1,656,710.31
Deduct from this the Amount of the Water Debt paid from the Sinking-Fund to June 30, 1876 . . .	$186,100.00	
And the Balance of the Sinking-Fund, June 30, 1876	179,441.33	365,541.33
Showing the Net Cost of the Water-Works to Nov. 30, 1876, to be about		$1,291,168.98

It thus appears, that, up to this time, the Water-Works have paid all their expenses and the interest on the Water Debt, and made a profit of $365,541.33, applicable to the payment of their cost.

The gross receipts from Water Rates and other sources during the past year have been $187,962.28. This includes $17,132.77 paid by the city for water bills of previous years. Deducting this amount leaves $170,829.51 as the actual income for the year, and the sum upon which estimates should be made for the coming year. This amount is enough to pay all current expenses and the interest on the Water Debt, and leave a sufficient balance to meet the requirements of the sinking-fund ordinance.

Of the $104,143.11 expended during the past year, and charged to extension account, $26,000 00 was paid out last winter, under an order from the City Council, to men

employed in cleaning out portions of Fresh and Little Ponds, and other work, at the uniform price of one dollar per day. As all this money was required to be paid directly to the workmen in order to furnish the labor, there was during the same time about $28,000.00 expended for pumping, teaming, lumber, iron pipes, tools, overseers, and other incidental expenses. These items together make more than half of the whole amount expended during the year.

The primary object of this order by the City Council was to furnish labor to destitute citizens who were receiving, or who otherwise would have to receive, aid from the Overseers of the Poor. No doubt the work was done under many disadvantages; but when we consider the amount of suffering saved among laboring-men and their families by this work, and the fact that the expense at our almshouse would have been considerably increased without it, the expenditure thus made would seem to have been wise and expedient.

The Auditing Committee of the Water Board, in the examination of the Registrar's accounts at the close of the year 1875, found several discrepancies, which caused them to distrust his honesty. The matter was placed in the hands of a special committee, who employed an expert, and commenced a thorough examination of the books and accounts. They soon found satisfactory proof of the Registrar's dishonesty, and so reported to the Board; and he was at once discharged. The next morning, the Registrar could not be found. The Mayor, who was a member of the committee, procured a warrant for

his arrest, and put it into the hands of the Chief of Police, who, up to this time, has not succeeded in arresting him. The examination of the books and accounts for several years past has been continued during the year; the result showing that the late Registrar is a defaulter to a large amount. The exact sum has not yet been determined, as the examination is still going on. When it is completed, a full report will be made. The city holds a bond in the sum of five thousand dollars, which will partly cover the amount stolen.

WATER SUPPLY, ETC.

The new sources of Water Supply made available by the new conduit connecting Spy and Little Ponds and Wellington Brook with Fresh Pond, it is believed, will prove sufficient to meet the wants of the city for some time to come. Some apprehension has been expressed in regard to the purity of our Water Supply, particularly of that portion recently added. In response to a petition presented by a number of our citizens to the City Council in the latter part of the year just ended, a joint committee was appointed to confer with the Water Board in regard to the whole subject of the quantity and quality of our Water Supply. A conference was held by the committee with the Water Board, after which the committee visited the various sources of our supply, and made an examination, so far as it could be done by observation. After this, a hearing was given to the leading petitioners before the committee and the Water Board, at which their view of the matter was freely stated; and

members of the Water Board expressed their views, and stated what had been done and recommended in times past in regard to the purity of the water, and the proper course to pursue further to protect and improve it. The subject seemed to be well understood by the Water Board in all its bearings; and they showed plainly that they had availed themselves of all usual scientific means to ascertain from time to time the quality of the water we use.

The committee, after getting all the information they could, determined to have a careful and scientific examination of all the waters in our supply; and for this purpose they engaged S. P. Sharples, Esq., State Assayer and Chemist, who has devoted much time to the subject of the quality of different waters used for domestic purposes. He made a careful analysis of the waters, and made a long and valuable report to the committee, containing information which all who are interested in this subject should have. The Report will be published with the City Documents, in connection with the Water Board papers; and I commend it to your careful examination. Meantime, I cannot forbear to present you with a few extracts from Prof. Sharples's Report. He says, "In fact, Nature understands her business, and, if we only give her time enough, will take care of all noxious organic matters in water. . . . Now, since the conduit enters into Fresh Pond comparatively near the surface, and at a distance of over half a mile from the inlet (leading to the pumps), which is at least twelve feet below high-water mark, and the water is discharged into a body of water sufficient for

nearly two years' supply for the whole city, it would therefore be probably many months from the time it entered the pond before it was taken out; . . . and moreover, since the waters of Little Pond, Spy Pond, and Wellington Brook, so closely resemble Fresh Pond in all particulars, I can see no possible danger that may arise from their use. . . . It will be seen from the analysis, that, while the water supplied to Cambridge is harder than most of the waters quoted (Cochituate, Mystic, Charles River, &c.), in point of purity, and freedom from sewerage matter, it compares favorably with the best of them; being fully equal, in this respect, to Cochituate, when delivered from the hydrants. . . . I would therefore recommend that the supply from Wellington Brook and the filter basin at Little Pond be utilized at once."

The Joint Committee of the City Council herein referred to made a full report to the last City Council; and I will only quote their conclusions here, recommending the whole Report to your careful consideration. They say, "In conclusion, your Committee feel that this whole subject of our water-supply and its protection is in competent hands, and can be safely left with them, providing the City Council make the appropriations necessary to carry out their recommendations. The Water Board is composed of gentlemen who have for years made this matter their study, and seem to understand the whole subject. They are personally interested, in their official capacity, that every thing should be done to keep their department up to a high standard, and, as citizens and tax-payers, that all appropriations asked for should be economically and judiciously expended."

With such evidence presented to us, it seems to me the citizens of Cambridge are to be congratulated on the convenience and purity of their water-supply; and while, without doubt, our city will, after a while, need a larger supply, and it is wise to anticipate, as far as it is practicable, the wants of the future, yet there does not seem to be any present necessity for anxiety on this account. I therefore recommend that whatever is necessary to protect and improve our present water-supply be done through our present agency, the Water Board. They advised the present year, in addition to the usual work of extending street pipes for supply purposes, the following measures to improve and preserve the quality of the water, for which, at the proper time, they will ask of you an appropriation: —

"1st, To secure a strip of land of sufficient width to enable the Board to preserve the purity of the water in Fresh Pond, which is, in fact, our great storage and settling reservoir.

"2d, To provide a basin which will receive nearly all the surface drainage now finding its way into Fresh Pond, where it can be filtered through a gravel bed before it can get into the pond.

"3d, To drive sheet piling around Little Pond, where the border is low, to prevent the drainage from the surrounding low lands from running into the pond," as an earth-bank cannot be made to stand there without a support to hold it.

SCHOOLS.

The number of teachers employed in our schools is 176, a decrease of 8 for the year. The number of scholars attending school is 7,554, showing a decrease of 9 from the previous year. There are now 29 schools in the city, an increase of 1 during the year. The amount expended during the year on account of schools was, —

For General Instruction	$159,318.00
Instruction for Evening Schools	5,881.50
Furniture and Apparatus for Evening Schools	2,126.47
Care and Repairs of Schoolhouses	32,052.43
Alterations of Schoolhouses	1,636.50
Books for Indigent Scholars	3,166.89
Stationery, &c., for Schools	406.77
Truant Officers	5,500.00
Total	$210,088.56

The general condition of our schools remains essentially the same as at the beginning of the year, and is of the most satisfactory and encouraging character. Some difficulty is experienced in adjusting the school accommodations, especially in the primary department, to the growth of the population in certain localities. We have schoolroom enough for the present number of scholars, and for the prospective increase for a few years to come; but in some instances children are of necessity excluded from the schools most easy of access.

Many of the schoolhouses appear to be deficient in the means of ventilation. As this is a matter which vitally affects the health and well-being of the pupils and

teachers, it should be remedied. It is believed that this can be done at a moderate expense.

Some reduction has been made during the year in the larger salaries of the teachers, but none in those amounting to seven hundred dollars or less per annum. This subject will probably receive further attention from the School Committee during the present year.

The schools have given general satisfaction, as to order, discipline, and improvement. There has not been a single instance in which the Committee has had cause to complain of negligence or indifference on the part of the teachers. The high, grammar, and primary schools have fully retained their deserved reputation of previous years. The evening schools for adults have maintained their former character, and are frequented by many who are sincerely solicitous to supplement the defects of early education, and whose improvement attests the earnestness of their endeavor, and justifies the expenditure made for their benefit.

It is a subject for congratulation that we are to so large an extent, in our city, realizing the ideal of a common-school system.

FIRE DEPARTMENT.

From the Annual Report of the Chief Engineer the following facts are gleaned. The department is represented as being well equipped and in an efficient condition. The loss by fire for the year ending Nov. 30, 1876, is estimated to be $150,000.00, with an amount of insurance representing $125,000.00. The city has been fortunately

exempt from large fires, the Chief reporting but two of importance, — that of the barrel factory, on Dec. 29, 1875; and that on Bridge Street, on Nov. 20, 1876. The Chief recommends the purchase of additional fire-alarm boxes, new hose, and two new hose-carriages; and also calls your attention to the need of a new steam fire-engine, to be located in the Fourth Ward, south of Main Street. He also alludes to the need of an additional hook-and-ladder truck in the First District, comprising the First and Fifth Wards, quarters for which are already provided in the new City Building, Brattle Square. The department houses are in excellent condition and a credit to the city, excepting the house occupied by Truck Company No. 2, which he thinks should be replaced by a new building. He also speaks of the fire-alarm telegraph as being in a satisfactory condition, with the recommendation that an alarm bell be placed in the tower of Engine House No. 5. The cost of the department during the year has been $77,417.21, which includes the purchase of a new steam fire-engine for Company No. 5. The department has been prompt in the performance of duty, and has exhibited a spirit worthy of emulation. The Chief renews his recommendation for the passage of a building-law similar to laws now in force in other cities and towns. While all the improvements suggested might add more or less to the efficiency or convenience of the department, some of them can undoubtedly be postponed without serious injury.

POLICE.

The amount expended for the Police Department during the past year was $71,405.53, and the amount paid into the city treasury by the officers for court fees was $4,889.33; leaving the net cost of the department $66,516.20. The whole number of arrests made was 1,629, a decrease of 162 from the previous year. 5,121 persons were lodged at the several station-houses, an increase of 281 over the number so accommodated a year ago. The police force consists of sixty members, forty-six of whom are on duty during the night, leaving but fourteen on duty during the day-time for the entire city. The whole night force is under the charge of one captain, with no regular assistant at either of the stations. The Chief of Police recommends the appointment of two sergeants for this purpose; a recommendation which I submit for your consideration.

STREETS.

There has been expended upon our streets during the past year the sum of $88,794.16. The cost of paving, sidewalks, and edgestones, has been $19,971.49. The Superintendent of Streets estimates that $75,000.00 will be required to keep the streets in order, and $15,000.00 for repairs on paving, sidewalks, &c., for the coming year. Owing to the manner in which they are built, some of the principal thoroughfares which are subjected to the continual wear of heavy teams require extensive repairs every year, involving a large annual outlay. It would

seem to be wise economy to pave such streets in a substantial manner. The Superintendent recommends that Main Street, from Third Street to Central Square, be paved in whole or in part this year. He estimates the cost of paving the southerly side of this street at $30,000.00. He also suggests that Prison Point Bridge Street, between the Boston and Lowell Railroad and the draw, requires paving, at an expense of about $6,000.00.

BRIDGES.

The Report of the Commissioner on Bridges between Cambridge and Boston shows that the total expense for the care and repair of West Boston, Craigie's, and Prison Point Bridges, during the year, was $8,862.66. The two first-named bridges are in good order, and, except in case of accident, will require no outlay beyond the running expenses during the coming year. Plans were completed, and a contract made late in the season, for rebuilding Prison Point Bridge at a cost of $17,000.00. The contractor is to rebuild the bridge with new oak pile foundations, and a hard pine superstructure; the flooring to be covered with a stone block pavement where practicable. The new draw is to be of the leaf pattern, but with iron instead of wooden main beams, and new draw piers each side of the bridge. The Commissioners expect the bridge will soon be completed.

By the Report of the Superintendent of Streets, it appears that the sum of $9,194.82 was expended upon the bridges which come under his charge, including Western Avenue Bridge, Cambridge Great Bridge, River

Street Bridge, Brookline Bridge, Third Street Bridge, Sixth Street Bridge, and North Avenue Bridge. The Western Avenue Bridge was nearly rebuilt, and repairs were made on all the others. The above bridges are now all in good condition, with the exception of the Brookline Bridge, which will require extensive repairs in the spring. The Superintendent estimates that the cost of repairs on these bridges, for the ensuing year, will be $9,000.00.

SEWERS.

There have been added to the length of the sewers in the city, during the past year, 6,262.51 feet. This includes the completion of the trunk sewer in Binney Street, the total cost of which has been $155,236.80. Of this amount $88,287.25 was expended in 1875. The total amount expended for sewers, catch-basins, and repairs, including $66,949.55 on account of the Binney Street sewer, has been $84,383.18. The total length of sewers in the city is now $59\frac{344}{1000}$ miles. That portion of the main sewer in Western Avenue lying between the outlet and Jay Street is too small, and should be rebuilt early in the season to relieve the Franklin Street district from overflow during heavy rains.

The sewer in Thorndike and First Streets is in a defective condition. The bottom where it is laid consists of soft material; and the extra weight placed upon it by raising the grade of the street has caused it to settle, in some places the top of the sewer being below the present outlet. For some time, no sewerage water appears to

have been discharged from the outlet, showing that the sewer is probably obstructed. The present outlet is through private lands, emptying into a dock in the rear of Bridge Street. The proper outlet would be in the Bridge Street sewer. This sewer should be repaired, or reconstructed and extended, the coming season.

BRIDGE STREET SEWER.

An Act of the Legislature, approved May 8, 1875, reads as follows: —

"The Boards of Mayor and Aldermen of the cities of Cambridge and Somerville, by concurrent action, shall, within two years of the passage of this Act, extend the main sewer, &c." (known as the Bridge Street Sewer), "from its present terminus at the Commissioners' line on Charles River, towards or into the deep-water channel of said river; the expense thereof to be borne by said cities respectively, in the same proportion as the expense of said main sewer is borne. The work hereby authorized shall not be commenced until the plans thereof are approved by the Harbor Commissioners."

Plans for this work were prepared by the Engineer of this city, and approved by the Harbor Commissioners and by the City Engineer of Somerville, early in June, 1876. An order was adopted in the Board of Mayor and Aldermen of this city, July 12, 1876, for extending this sewer in accordance with the provisions of the above Act, and was transmitted to the Board of Mayor and Aldermen of Somerville for "concurrent action." As they have failed to take such action up to the present time, no

further steps have been taken towards the completion of the work. It is apparent that this city has done all in its power to carry out the provisions of the Act, and has relieved itself of all responsibility.

LOW LANDS.

Under the provisions of the respective Acts of the Legislature of the Commonwealth to provide for the prevention and abatement of nuisances, and the preservation of the public health, approved in the years 1869, 1872, and 1873, the City Council established the grade of cellars at thirteen feet above mean low water; and in December, 1871, orders were adopted directing the filling of low lands in the inhabited portion of the city lying in the neighborhood of Washington Street. Since that time, various other orders have been adopted, requiring the filling of low lands in different sections of the city known as the Cambridge Street District, Miller's River District, Cowperthwaite Street District, Sparks Street District, and Franklin Street District.

In accordance with these orders, notices were served upon the owners of the estates lying within the respective districts, directing them to fill their lands to the prescribed grade. The owners failing to comply with such orders, the Board of Mayor and Aldermen proceeded to fill the lands in conformity with the statute.

The filling of all the districts was completed in 1876 at a total cost of $559,739.95, as shown by the following schedule: —

Washington Street District	$150,194.02
Cambridge Street District	57,121.02
Miller's River District	94,921.33
Cowperthwaite Street District	49,895.83
Sparks Street District	19,938.75
Franklin Street District	187,669.00
Total	$559,739.95

Under the provisions of the several Acts relative to low land filling, assessments were laid upon the owners for the cost of filling their lands; the expense of filling all public streets, lanes, and contemplated streets, being borne by the city. The entire amount thus assessed upon the owners was $350,912.97: of this amount there has since been abated the sum of $44,940.17, and $60,-127.63 has been paid into the city treasury. The amount assessed upon estates which have been surrendered to the city since the assessments were made is $38,973.99; leaving a balance still unpaid of $206,871.18, of which the sum of $47,103.73 has been apportioned, under the law, into five equal parts, one of which is payable annually, the city having a lien upon the property as security. This leaves a balance of $159,767.45 still unadjusted, of which the sum of $123,091.50 was assessed upon the Franklin Street District, Dec. 13, 1876; and for this the bills have not yet been issued. The owners in the latter district may have their assessments apportioned into five annual payments, provided application is made previous to Feb. 15, 1877; after which time the bills will be presented by the City Treasurer, and the privilege ceases. In case any owner is dissatisfied with the assessment

made, he may, within six months after receiving notice thereof, apply to the County Commissioners for a jury to revise the assessment; or, instead of making such complaint, he may, within sixty days, give notice to the Mayor and Aldermen, and the city shall thereupon take the land. If a disagreement arises as to damage done by such taking, the matter may be referred to the County Commissioners for adjustment, making due allowance for the improvement made by the filling.

Availing themselves of this right, the owners of sixty-five estates, or lots, have surrendered their property, valued at $130,912.00. A settlement has been made with forty-six of these owners, whose estates were valued at $81,071.00, either by withdrawal of surrender, by satisfactory adjustment of assessment, or by payment in full by the city; leaving unsettled eighteen estates, valued at $43,788.00. The total amount paid by the city for surrendered estates is $45,205.02, and the property has been conveyed to the city. In some instances, in effecting a final settlement for land surrendered, it has been found expedient to increase the awards as originally made by the appraisers, in order to avoid litigation; and by this means amicable arrangements have been made between owners and the city, and a large number of suits has been withdrawn from court.

In all cases of surrenders which have been withdrawn by adjustment with the several parties interested, it has been deemed advisable to make every reasonable allowance in order to induce the owners to retain their property, as, in most cases, it would have been difficult to

dispose of the estates without considerable loss. In the settlement of these cases, no little difficulty has been experienced in determining what was equal justice to all parties, as the owners of the several estates were deeply impressed with the belief, that, the entire work of filling being a sanitary measure, the expense should have been borne by the general public.

DISPENSARY.

The Cambridge Dispensary has been in operation two years. It was organized for the purpose of providing medical attendance and medical supplies free to the sick poor at their homes, or, for those able to leave their homes, at a central office. During these two years, it has treated 3,560 different patients, — 1,624 at their homes, and 1,936 at the central office. To those treated at their homes 5,815 visits have been made, and 4,452 patients have called at the central office for treatment. The total cost of this medical service, including the medicines, has been $3,302.11.

Funds for maintaining this charity have been furnished by the churches of this city, and by an annual contribution from the City of $1,000.00 per annum. As a large portion of the service performed by the Dispensary would, of necessity, have fallen upon the Overseers of the Poor, the appropriation made by the City for this purpose was, in my judgment, judicious, and should be continued.

GENTLEMEN, — The great increase in the number of destitute persons, occasioned by the scarcity of remunerative employment, admonishes us that our responsibilities are not terminated with the easy promises of inauguration. We cannot shut our eyes to the unwelcome fact, that one in every eight of our population required aid from the Overseers of the Poor last year. Shall we be true to our duty if we fail to investigate the causes of this condition, or if we do not labor with all our might, by practical measures, by wise direction of affairs, so far as we can, to restore a healthier state? The problem of employing those who are willing to labor, but who are obliged to confess with sorrow, "No man hath hired us," is one which demands our earliest and most careful consideration. I heartily approved the plan adopted last year, of giving employment, at a low rate of wages, to those who might otherwise have been compelled to accept charity. I cannot doubt that much suffering was thus spared, particularly among those whose self-respect would have prevented them from accepting aid from the city without an equivalent. There is reason for believing, also, that a large portion of the amount thus expended was saved, by lessening the cost of our almshouse department.

I invite you to suggest, I invite you to join me in perfecting, some method by which those who have families dependent upon them may have an opportunity to earn enough to support them, and, at the same time, to return a full, or at least a partial, equivalent to the city.

In conclusion, gentlemen, let me remind you that we

assume the responsibility of caring for the interests intrusted to us at a critical period. Our city is suffering from a severe depression in trade and industry, which extends over the whole country, and, in a measure, throughout the civilized world. We see capital lying idle; labor unemployed, or, if employed, but inadequately rewarded; incomes from property laboriously acquired reduced, or entirely suspended; and most branches of industry unremunerative, without immediate prospect of a change for the better. I trust, that, by united and earnest action, we may, with the blessing of our heavenly Father, prove ourselves faithful stewards, that we may not disappoint those who placed us in office, and may win the approval of those who opposed us, but who, I am persuaded, stand ready to support all our acts which shall be directed to the attainment of the object which we all desire, — the prosperity of our city.

It would be the height of my ambition, at the end of my term of service, to point to an increased activity in our industries, our willing labor at work, our delinquent taxes paid, our debt reduced, and our city enjoying a prosperity worthy of the thrift, intelligence, and character of its people. I could then feel that it had been a happy new year indeed to all my fellow-citizens, as I now wish it may be one to you.

ANNUAL REPORT

OF

THE COMMITTEE ON FINANCE.

In conformity with the requirements of the Revised Ordinances, the Joint Standing Committee on Finance submits the following Report for the financial year ending Nov. 30, 1876: —

RECEIPTS AND DISBURSEMENTS.

Cash in hands of Treasurer, Nov. 30, 1875	$115,579 25	
Cash Receipts for the year	2,360,248 00	
		$2,475,827 25
Cash expended during the year		2,448,669 67
Balance in hands of Treasurer, Nov. 30, 1876		$27,157 58

APPROPRIATIONS AND EXPENDITURES.

The amount appropriated at the commencement of the year to defray the current expenses was $1,570,856.71. In consequence of the surrender of estates under the provisions of the Act of 1872 in relation to the filling of low lands, it subsequently became necessary to make an additional appropriation of $50,000.00 to pay for the same: the expense incurred in ballasting the Binney Street Sewer required a further appropriation of $12,000.00, making an addition of $62,000.00.

Original Appropriation	$1,570,856 71	
Additional Appropriation	62,000 00	
		$1,632,856 71
Total Amount expended		1,565,737 34
Balance unexpended		$67,119 37

ANALYSIS OF CITY DEBT.

Amount of City Debt, Nov. 30, 1875	$4,706,755 20	
Added during the year: —		
State and County Taxes	84,426 47	
Bills approved and Interest due,	4,448 08	
City and Water Loan Bonds	262,000 00	
		$5,057,629 75
Amount paid during the year: —		
State and County Tax	$96,160 73	
City and Water Loan Bonds	100,900 00	
Approved Bills	30,394 47	
		227,455 20
Amount of City and Water Debt, Nov. 30, 1876		$4,830,174 55
Amount of Debt, Nov. 30, 1875		4,706,755 20
Increase of Debt during the year		$123,419 35
Amount of Debt, Nov. 30, 1876		$4,830,174 55
Deduct Value of Sinking-Funds and Cash in hands of Treasurer		738,544 76
Amount of Net Debt, Nov. 30, 1876		$4,091,629 79

CLASSIFICATION OF CITY DEBT.

Water Loan Bonds	$1,500,300 00	
City Bonds	3,186,000 00	
Daniel White Charity	5,000 00	
Dowse Institute Fund	10,000 00	
Sanders Temperance Fund	10,000 00	
State Tax	62,586 00	
County Tax	21,840 47	
Bills approved and Interest due	4,448 08	
City Note	30,000 00	
		$4,830,174 55

SINKING-FUND OF THE WATER-WORKS.

Amount of Fund, June 30, 1875,	$132,581 71	
Added during the year ending June 30, 1876 . . .	50,557 12	
		$183,138 83
Deduct Amount paid on Account of Loan of 1865		6,000 00
Total Amount of Fund, June 30, 1876 . .		$177,138 83
Accrued Interest to June 30 .	$2,302 50	
Value of Fund, June 30, 1876.	179,441 33	
Invested as follows: —		
Cambridge Water Bonds (par value $177,300.00) . .	$176,803 75	
Temporary Loan to the City .	335 08	
		$177,138 83
Water Debt, Nov. 30, 1876 .	$1,500,300 00	
Deduct Value of Fund, June 30, 1876	179,441 33	
Net Amount of Water Debt .	$1,320,858 67	

SINKING-FUNDS OF THE CITY OTHER THAN SINKING-FUND OF THE WATER-WORKS.

Amount of Fund as reported Nov. 30, 1875 . . .	$472,430 28	
Added during the year . .	174,853 00	
		$647,283 28
Deduct Amount paid for Interest	$2,216 43	
City Debt due July 1, 1876 .	100,000 00	
Amounts carried forward,	$102,216 43	$647,283 28

Amounts brought forward,	$102,216 43	$647,283 28
Also deduct Accrued Interest unpaid Nov. 30, 1875, included in Previous Report as part of Funds . . .	11,159 67	
Premium paid for Bonds reducing all to par Value . .	14,080 00	
		127,456 10
Total Amount of Funds, Nov. 30, 1876		$519,827 18
Accrued Interest on Fund .	$12,118 67	
Value of Funds, Nov. 30, 1876,	531,945 85	
Invested as follows: — .		
City of Cambridge Bonds at par Value	$488,000 00	
Notes secured by Mortgage .	20,146 51	
Cash on hand	11,680 67	
		$519,827 18
Amount of City Debt, exclusive of Water Debt, Nov. 30,	$3,329,874 55	
Deduct Value of Funds, and Cash in hands of City Treas.	559,103 43	
Net Amount of General City Debt, Nov. 30, 1876 . .	$2,770,771 12	
Net Amount of General City Debt, Nov. 30, 1875 . .	2,723,545 67	
Absolute Increase of the General Indebtedness of the City during the year . . .	$47,225 45	

UNCOLLECTED TAXES, 1876.

City Tax	$942,351 98	
State Tax	62,586 00	
County Tax	21,840 47	
Bank Tax	6,339 15	
		$1,033,117 60
Of which there has been collected	$814,175 29	
Abated	17,619 44	
Discounted	32,822 86	
		864,617 59
Balance uncollected		$168,500 01

UNCOLLECTED TAXES, 1875.

Amount uncollected Nov. 30, 1875 . .		$174,310 42
Of which there has been collected	$91,718 80	
Abated	4,884 90	
		96,603 70
Balance uncollected		$77,706 72

The discrepancy between amount uncollected as given above, and amount as reported last year, was caused by an error in last year's tax-warrant.

UNCOLLECTED TAXES, 1874.

Amount uncollected Nov. 30, 1874 . . .		$47,266 17
Of which there has been collected	$33,764 38	
Abated	1,544 37	
		35,308 75
Balance uncollected		$11,957 42

Of the following assessments there remained uncollected Nov. 30, 1876: —

For Drains	$5,037 38
Grading Cowperthwaite Street District	13,208 27
Grading Sparks Street District	7,420 05
Grading Cambridge Street District	22,477 72
Grading Miller's River District	63,920 97
Grading Washington Street District	48,094 37
Abatement of Nuisances	42,500 71
	$202,659 47

The following tables show the variation in the number of polls, value of personal and real estate, and number of dwellings in the city, for the years 1875 and 1876, as appears on the books of the Assessors on the first day of May in each year: —

Polls and Valuation of Estates for 1876.

Ward.	Polls.	Personal.	Real Estate.	Total.	Dwellings.
1	1,909	$5,362,808	$12,816,800	$18,179,608	1,455
2	3,219	4,537,575	12,611,000	17,148,575	2,207
3	2,570	1,995,870	7,545,800	9,541,670	1,361
4	2,881	1,663,000	8,687,900	10,350,900	1,956
5	1,220	1,070,300	6,345,400	7,415,700	903
Total,	11,799	$14,629,553	$48,006,900	$62,636,453	7,882

Polls and Valuation of Estates for 1875.

Ward.	Polls.	Personal.	Real Estate.	Total.	Dwellings.
1	1,859	$5,918,078	$13,195,200	$19,113,278	1,402
2	3,351	5,078,728	13,290,900	18,369,628	2,179
3	2,744	2,196,108	8,044,000	10,240,108	1,351
4	2,849	1,980,600	9,013,300	10,993,900	1,887
5	1,180	1,294,200	6,611,900	7,906,100	857
Total,	11,983	$16,467,714	$50,155,300	$66,623,014	7,676

From the above tables it will be seen that the decrease in valuation is, —

Personal Estate	$1,838,161 00
Real Estate	2,148,400 00
Total	$3,986,561 00

Decrease in number of polls	184
Increase in number of houses	206

The rate of taxation was $16 per $1,000, subject to the established discount of four per cent if paid before Oct. 10, making the net rate $15.36 per $1,000.

It will be seen from the foregoing report, that the absolute increase of indebtedness for municipal purposes was $47,225.45; which is more than accounted for by the following items over which the present City Council had no control, viz.: —

Amount paid for surrendered Estates	$43,066 38
Amount paid for ballasting Binney Street Sewer	8,593 36
Amount of Premium on Bonds held by the Commissioners of the General Sinking-Funds deducted from Value of said Funds	14,080 00
Total	$65,679 74

Respectfully submitted.

ISAAC BRADFORD,
WILLIAM WRIGHT,
SAM'L L. MONTAGUE,
FRANK A. ALLEN,
K. S. CHAFFEE,
SEYMOUR B. SNOW,
PEREZ G. PORTER,
JOS. H. BANCROFT,
GEORGE F. WHITING.

SCHEDULE OF EXPENDITURES

FOR

THE FINANCIAL YEAR ENDING NOV. 30, 1876.

For Almshouse.

Books and Stationery	$114 38
Buckets	19 50
Bread	2,814 22
Clerk of Overseers, Salary of	300 00
Car-Tickets	109 50
Cows	62 00
Dry-Goods and Clothing for House	3,133 43
Expressage	135 25
Fuel at the House	2,472 30
Fuel for the Poor	10,357 81
Furniture	480 80
Fish	500 96
Flags and Torpedoes	29 40
Gas	582 70
Grain and Meal	1,260 14
Groceries	4,508 27
Harnesses and Repairs	125 02
Household Utensils	197 60
Heating Apparatus and Repairs	233 57
Hardware, Drain-Pipe, Mats, &c.	518 96
Horses	400 00
Horse Hire	97 00
Amount carried forward	$28,452 81

Amount brought forward . .	$28,452	81
Horse Shoeing	624	44
Horse Blankets	21	50
Incidental Expenses of Warden . .	465	80
Collecting Bills	30	00
Sundry Petty Expenses . . .	19	25
Labor	6,567	00
Manure	128	00
Medicine	212	49
Paving	133	73
Printing and Advertising . . .	102	63
Provisions at the House . . .	3,746	69
Poor, Goods delivered to . . .	20,556	09
Boots and Clothing	1,521	91
Medicine and Medical Attendance .	552	48
Burial Expenses	1,189	25
Aid rendered	5,270	80
Rent of Rooms	1,018	56
Repairs and Alterations . . .	2,219	49
Rent of Office for Clerk . . .	33	34
Salaries : —		
Warden	949	99
Assistant Warden	1,054	00
Assistant Matron	300	00
Organist	10	00
Sunday-school Expenses . . .	100	00
Stamps and Postage	36	50
Support of Persons in State Institutions	7,690	23
Settlements, Examination of . .	62	50
Shoe-Findings	81	55
Supplies for the House . . .	246	13
Salary of Physician	375	00
Snuff and Tobacco	167	30
Seeds	30	40
Travelling Expenses	209	10
Veterinary Services	64	00
Wages	1,226	77
		$85,469 73

Appropriation .	$74,000 00	
Additional Appropriation	12,933 95	
		$86,933 95
Amount of Expenses . . .		85,469 73
Balance unexpended . .		$1,464 22

For Cambridge Free Dispensary.

Amount paid Trustees		$1,000 00
Appropriation	$1,000 00	
Amount of Expenses . . .	1,000 00	

For Care and Repairs of Bridges.

Fuel	$4 25	
Labor	3,192 73	
Lumber	1,388 39	
Nails	21 65	
Piles and Girders	966 00	
Repairs	1,982 52	
Repairing Walden Street Bridge .	1,615 60	
Stove	4 10	
Towing Scow	16 58	
Water-Rates	3 00	
		$9,194 82
Appropriation . .	$8,000 00	
Additional Appropriation	1,200 00	
	$9,200 00	
Amount of Expenses . . .	9,194 82	
Balance unexpended . .	$5 18	

For Care and Maintenance of West Boston, Craigie's, and Prison Point Bridges.

Driving Piles	$79 50
Engineering	250 00
Fuel	346 99
Amount carried forward,	$676 49

Amount brought forward,	$676 49	
Gas	956 73	
Gas-Fixtures	4 28	
Iron Work	201 04	
Labor	2,074 40	
Lumber	201 48	
Moving Building	6 00	
Paving	1,857 01	
Piles	70 00	
Painting Fence West Boston Bridge	137 25	
Printing and Advertising	19 72	
Paid for Displacement of Water	32 05	
Repairs	1,761 89	
Supplies	52 32	
Steam Pump	52 50	
Salary of Commissioner	500 00	
Watering Bridges	250 00	
Water-Rates	9 50	
		$8,862 66
Appropriation	$20,250 00	
Amount of Expenses	8,862 66	
Balance unexpended	$11,387 34	

For Care and Repairs of Schoolhouses.

Blanks and Binding	$45 10	
Chemicals	24 25	
Car-Tickets	81 00	
Diplomas	158 45	
Furniture	554 08	
Fuel	8,485 18	
Furnaces and Repairs	4,619 98	
Gas	142 17	
Hardware	445 95	
Housing Fuel	95 50	
Incidental Expenses	52 00	
Janitors	9,735 32	
Amount carried forward,	$24,438 98	

Amount brought forward	$24,438 98	
Librarian at High School	50 00	
Mats, Dusters, Brushes, &c.	807 97	
Page of School Committee	25 00	
Printing and Advertising	544 55	
Ringing Bell	18 75	
Rent of Schoolroom	225 00	
Repairs	5,324 18	
Records of High School	100 00	
Tuning Pianos	20 00	
Water-Rates	498 00	
		$32,052 43
Appropriation	$48,000 00	
Amount of Expenses $32,052 43		
Transferred 12,562 47		
	44,614 90	
Balance unexpended	$3,385 10	

For Care and Repairs of Water-Works.

Auditing Accounts	$1,044 40
Analysis of Water	70 00
Car-Tickets, &c.	85 25
Counterfeit Bills, Allowance for	25 50
Distributing Water-Bills	49 00
Expressage	10 20
Fuel	12,123 97
Gravel	56 00
Horse Hire	302 00
Horse Shoeing	76 97
Horse Blankets, Whips, &c.	16 00
Hay and Grain	211 09
Oil, Hose, &c.	517 72
Packing	97 98
Printing, Binding, and Advertising	268 37
Record Books and Stationery	161 05
Repairs	23 49
Repairs of Harnesses	49 72
Amount carried forward	$15,188 71

Amount brought forward		$15,188 71	
Rubber Boots		17 50	
Salaries: —			
Registrar		1,833 33	
Superintendent		2,500 00	
Clerk of Water Board		200 00	
Services in Office		1,991 87	
Sundry Workmen		5,865 46	
Sundry Expenses		27 00	
Stamps		87 00	
Tools		58 16	
Thawing Water-Pipes		73 66	
Turkeys for Workmen		39 22	
Water-Rates refunded		704 74	
			$28,586 65
Appropriation	$25,000 00		
Additional Appropriation	5,000 00		
		$30,000 00	
Amount of Expenses		28,586 65	
Balance unexpended		$1,413 35	

For Cemeteries.

Bricks	$35 00
Care of Old Ground	12 00
Car-Tickets	20 00
Cutting Numbers	35 40
Fuel	68 23
Grading and Sodding	915 60
Gratings	7 08
Grave Covers and Straps	57 30
Hardware and Tools	51 93
Horse, Use of	104 15
Lumber and Cement	59 89
Manure	334 50
Plants and Seeds	226 00
Painting Gates	6 13
Amount carried forward	$1,933 21

Amount brought forward,	$1,933 21	
Printing	15 17	
Repairs	19 29	
Salary of Superintendent	1,500 00	
Sods	446 37	
Stone Posts	731 90	
Stone	36 50	
Sharpening Picks	13 52	
Sundry Workmen	8,082 19	
Stamps and Stationery	7 72	
Trees	70 00	
Truckage	45 50	
Wedges, &c.	20 80	
		$12,922 17
Appropriation	$15,000 00	
Amount of Expenses	12,922 17	
Balance unexpended	$2,077 83	

For City Engineering.

Binding Maps and Plans	$71 75	
Car-Tickets	166 10	
Carpenter's Work	9 27	
Drawing Materials	64 18	
Horse Keeping	300 00	
Horse Hire	177 00	
Instruments and Repairs	1,134 85	
Iron Work	9 18	
Logarithms, Tables of	4 00	
Repairs	2 25	
Salary of Engineer	3,000 00	
Services in Office	2,790 83	
Stone Bounds and Setting	207 12	
Supplies	40 92	
Stationery	9 38	
		$7,986 83
Appropriation	$9,000 00	
Amount of Expenses	7,986 83	
Balance unexpended	$1,013 17	

For Compensation of Auditor of School Committee.

Auditor's Salary		$150 00
Appropriation	$150 00	
Amount of Expenses	150 00	

For Compensation of Secretary of School Committee.

Secretary's Salary		$300 00
Appropriation	$300 00	
Amount of Expenses	300 00	

For Dana Library.

Assistants in Library	$387 42	
Books	1,417 94	
Binding Books	348 30	
Brooms and Dusters	3 37	
Fuel	60 66	
Furniture and Matting	130 47	
Gas	359 77	
Janitor	169 50	
Magazines and Papers	189 72	
Printing	290 00	
Repairs	76 21	
Rent of Rooms	675 00	
Salaries: —		
Librarian	700 00	
Assistant Librarian	483 34	
Superintendent of Reading-Room	325 00	
Sundry Expenses of Librarian	19 77	
Stationery	133 84	
Taxes	163 20	
Water-Rates	28 00	
		$5,961 51
Appropriation	$6,000 00	
Amount of Expenses	5,961 51	
Balance unexpended	$38 49	

For Evening Schools for Adults.

Advertising	$3 25	
Books, Ink, and Stationery	62 03	
Cleaning	3 00	
Drawing Materials	218 89	
Fuel	64 40	
Furniture	147 50	
Fitting Room in Ward One Building	441 00	
Gas	175 19	
Gas Fixtures and Labor	211 62	
Instruction	5,881 50	
Janitors	527 50	
Lumber	4 10	
Moving Furniture	45 95	
Rent of Room	90 00	
Repairs	132 04	
		$8,007 97
Appropriation	$7,700 00	
Additional Appropriation	307 97	
	$8,007 97	
Amount of Expenses	8,007 97	

For Extension of Water-Works.

Auctioneer's Services	$10 00	
Brick	134 12	
Boots and Mittens	12 00	
Books	1 50	
Cleaning out Fresh Pond	3,553 58	
Conduit, Contractor for	9,357 93	
Conduit, Labor on	17 70	
Carpenter's Work	43 15	
Castings and Labor	388 63	
Car-Tickets	3 50	
Drain in Lakeview Avenue	69 09	
Engineering	148 40	
Amount carried forward	$13,739 60	

Amount brought forward	$13,739 60	
Engine, Use of, at Conduit	119 40	
Fuel	553 61	
Furniture	150 81	
Gates	600 30	
Gate Houses	462 49	
Gravel	312 00	
Hay and Grain	85 99	
Horse Hire	47 00	
Hydrants	2,180 75	
Iron Work	78 94	
Lumber, Lime, and Cement	1,545 17	
Lanterns, Nails, &c.	138 29	
Lead	1,059 63	
Legal Opinion	100 00	
Meters and Repairs	210 82	
Measuring Height of Water	54 00	
Painting Engine	94 66	
Pipe and Castings	18,035 75	
Pipe for Drain, and Labor	272 78	
Packing	135 00	
Printing	52 00	
Rent of Wharf	250 00	
Reading Gauge	16 00	
Railroad Track	433 49	
Services of Man at Crossing	11 87	
Sundry Workmen	49,499 29	
Sand and Stone	4,732 06	
Sharpening Tools	129 32	
Tide Gates	248 71	
Tools, Hardware, and Wheelbarrows	1,355 75	
Truckage and Freight	2,368 49	
Telegrams	2 30	
Wagon and Harness	124 25	
Work at Little Pond	4,942 59	
		$104,143 11
Appropriation	$110,000 00	
Amount of Expenses	104,143 11	
Balance unexpended	$5,856 89	

For Filling Low Lands.

Franklin Street District, filling	$55,677 63	
Drain, Franklin Street District	284 54	
Raising House, Franklin Street District,	170 37	
Otis and Ninth Streets, filling	221 80	
Dyke Street, Assessment refunded	50 00	
Washington Street, Assessment refunded,	97 37	
		$56,501 71
Appropriation	$56,501 71	
Amount of Expenses	56,501 71	

For Fire Department.

Expressage	$113 54
Fuel	1,947 52
Fines of Members	439 00
Furniture, Shades, and Bedding	425 93
Gas	1,325 54
Heating Apparatus	490 00
Hose and Repairs	728 70
Hose Dressing	139 13
Hardware, Dusters, &c.	596 98
Hay, Grain, and Straw	3,087 85
Harnesses and Repairs	366 40
Horse Blankets	11 00
Horse Shoeing	601 54
Horse Hire	1,110 33
Labor	242 67
Ladders and Pole	151 75
Lanterns	60 50
Printing and Advertising	69 00
Rope	62 78
Repairs of Houses	1,654 48
Repairs of Steamers and Trucks	2,197 70
Repairs of Heating Apparatus	180 31
Repairs, sundry petty	297 46
Amount carried forward,	$16,300 11

Amount brought forward . .	$16,300	11
Rent of Room	80	00
Ringing Bells	71	00
Refreshments	148	98
Services of Members	41,323	23
Steamer	4,250	00
Salaries: —		
Chief Engineer	1,200	00
Assistant Engineers . . .	1,600	00
Clerk of Board	50	00
Supplies	651	90
Saddle	5	00
Sheaves	20	40
Sundry Small Expenses . . .	71	34
Travelling Expenses	23	00
Telegraphic Fire Alarm: —		
Battery Stands	115	00
Wire, Battery Hooks, and Tapper .	411	63
Repeater, Striker, and Insulator .	238	49
Vitriol and Zinc	1,027	39
Signal-Boxes	750	00
Telegraph-Poles	135	25
Tripod, Brackets, &c. . . .	30	04
Repairs	22	87
Labor	213	25
Soap	8	34
Washing	24	00
Car-Tickets	33	25
Veterinary Services	227	00
Water for Hydrants and Reservoirs .	6,314	00
Water-Rates	149	00
Washing	503	39
Ward One Building: —		
Painting and Papering . . .	290	60
Paper, Moulding, &c. . . .	140	82
Furniture	970	43
Hanging Bells	17	50
		$77,417 21

Appropriation .	$77,000 00	
Additional Appropriation . . .	425 00	
		$77,425 00
Amount of Expenses . . .		77,417 21
Balance unexpended . .		$7 79

For Hopkins Fund.

Appropriation	$900 00

[Transferred to "Instruction in Public Schools," towards salary of Classical Teacher in High School.]

For Incidental Expenses.

Auditing Accounts	$1,132 99
Assistant Assessors' Services . .	716 00
Abstract of Conveyances . . .	246 58
Auctioneers' Fees	111 50
Advertising	900 60
Bathing Yards	104 21
Clerical Assistance to Treasurer .	1,000 00
Clerical Assistance to City Clerk .	1,500 00
City Hall: —	
Assistant Messenger . . .	1,098 00
Cleaning and Labor . . .	800 98
Fuel	812 89
Water-Rates	84 00
Refreshments	24 00
Furniture and Repairs . . .	111 88
Safe	138 00
Supplies, Oil, Brooms, &c. . .	93 56
Repairs	575 73
Carriage Hire	236 75
Car-Tickets	480 00
Care and Repairs of Clocks . .	382 01
Census of Births	95 00
Amount carried forward . .	$10,644 68

Amount brought forward . .	$10,644 68
Centennial Celebration, Cambridge .	83 50
Preparing and printing Account of	601 50
Centennial Celebration, Philadelphia,	373 72
Decoration Day.	700 00
Directories	52 50
Drinking Fountains, Removal of .	76 11
Dredging Broad Canal . . .	4,450 00
Expressage	36 10
Gas in City Buildings . . .	1,405 71
Hay Scales, Repairs of . . .	145 23
Hardware	6 73
Health Department	46 00
Cesspool in Franklin Street . .	616 11
Ice in City Buildings . . .	201 90
July 4, Expenses of Celebrations .	1,110 86
Legal Services and Expenses . .	2,976 51
Music at High School . . .	37 71
Moving Clock and Bell . . .	100 00
Newspapers	115 00
Page of Common Council . .	125 00
Postage and Box Rent . . .	10 25
Posting Bills	10 00
Record Books	19 75
Reporting Deaths	284 20
Recording Births, Deaths, and Marriages	875 45
Recording Deeds	52 65
Ringing Bells	235 25
Settlement of Claims . . .	6,388 57
Tax Bill, Belmont	95 00
Tax Bill, Somerville . . .	1,153 20
Taxes and Assessments refunded .	138 18
Tax Bills, making and distributing, &c.	787 75
Vaccination	18 00
Ward One Building: —	
Alterations and Repairs . . .	304 56
Amount carried forward . .	$23,633 00

Amount brought forward . .		$23,633 00	
Building Fence		20 50	
Constructing Drain		78 28	
Janitor		1,370 52	
Fuel		181 25	
Hardware, Tools, Oil, &c. . .		71 26	
Furniture at Armory . . .		920 00	
Furniture in other Rooms . .		127 11	
Cleaning		154 20	
Ward Four Building: —			
Janitor		1,408 32	
Repairs and Cleaning . . .		187 84	
Hose, Oil, &c.		32 74	
Water-Rates		161 84	
Ward Officers, Services of . . .		175 00	
Ward Rooms, Care and Expenses of .		177 64	
Weighing Fuel		105 00	
			$39,449 18
Appropriation		$45,000 00	
Amount of Expenses,	$39,449 18		
Transferred . . .	3,900 00		
		43,349 18	
Balance unexpended . .		$1,650 82	

For Instruction in Public Schools.

Salary of Superintendent . . .		$3,000 00	
Salaries of Teachers		156,318 00	
			$159,318 00
Appropriation .	$157,100 00		
Additional Appropriation . . .	2,218 00		
		$159,318 00	
Amount of Expenses . . .		159,318 00	

For Interest and Bank Discounts.

Interest on City Debt . . .		$275,896 25	
Sundry Banks, &c., on Temporary Loans		15,222 37	
			$291,118 62

Appropriation		$300,000 00
Amount of Expenses . . .		291,118 62
Balance unexpended . .		$8,881 38

For Lighting Streets.

Alcohol		$94 05	
Care of Lamps and Lighting . .		5,658 47	
Cocks, Burners, &c.		24 77	
Expressage		17 65	
Gas		14,053 55	
Horse Hire		3 00	
Lamps, Frames, &c.		90 00	
Ladders		28 00	
Oil, Matches, and Glass . . .		368 84	
Posts and Repairs		1,117 91	
Painting Posts		164 56	
Printing and Advertising . . .		15 50	
Repairs of Lanterns, &c. . . .		309 75	
Superintendent of Lamps, Salary of .		400 00	
Street Signs		20 00	
			$22,366 05
Appropriation .	$21,400 00		
Additional Appropriation	966 05		
		$22,366 05	
Amount of Expenses . . .		22,366 05	

For New Schoolhouses and Alterations.

Fence at Agassiz Schoolhouse . .		$426 00	
Mason Work		57 30	
Plumbing		153 20	
Plans and Specifications High School House		1,000 00	
			$1,636 50
Appropriation . .	$700 00		
Additional Appropriation	936 50		
		$1,636 50	
Amount of Expenses . . .		1,636 50	

For Paving.

Brick	$320 00	
Gravel and Sand	2,246 86	
Labor	5,667 08	
Paving and Materials	9,731 88	
Stone	2,005 67	
		$19,971 49
Appropriation	$20,000 00	
Amount of Expenses	19,971 49	
Balance unexpended	$28 51	

For Police and Watch.

Billies	$9 25
Buttons	30 00
Boarding Horses	600 00
Care of Court-Room	25 00
Care of Police Boat	5 00
Cleaning Stations	47 60
Expressage	27 00
Furnace	100 00
Fuel	1,413 29
Furniture and Bedding	254 09
Gas	902 72
Hardware	15 64
Horse Hire	27 00
Horse Shoeing	61 49
Ice	38 40
Lanterns, Cups, &c.	30 71
Labor	76 38
Medical Attendance	66 00
Moving Safe	50 00
Oil, Disinfectants, &c.	51 27
Printing	12 25
Repairs at Stations	180 73
Repairs of Wagon	84 73
Amount carried forward	$4,108 55

Amount brought forward . .	$4,108 55	
Repairs of Harnesses	12 99	
Repairs	13 74	
Services of Policemen . . .	64,846 50	
Salary of Chief of Police . . .	2,000 00	
Supplies, Food, &c., at Stations . .	164 30	
Stamps and Stationery . . .	61 51	
Travelling Expenses	57 73	
Telegrams	11 41	
Telegraph, Labor on	13 50	
Washing	81 30	
Water-Rates	34 00	
		$71,405 53
Appropriation	$72,000 00	
Amount of Expenses . . .	71,405 53	
Balance unexpended . .	$594 47	

For Police Court-Room, &c., Ward One.

Bed Frames, &c., in Cells . . .	$133 00	
Contractor	5,402 64	
Curb	990 67	
Carting Gravel	334 00	
Furniture and Carpets . . .	651 95	
Fitting Court-Room	376 00	
Gas Pipe and Fitting	100 48	
Gas Fixtures, Globes, &c. . . .	759 50	
Grading	60 00	
Heating Apparatus	3,302 90	
Lumber and Hardware . . .	198 05	
Labor	187 75	
Paving and Materials	550 80	
Painting	39 72	
Plumbing, Hose, &c.	142 14	
Plans and Superintendence . .	249 20	
Shades and Fixtures	334 59	
Settees	77 94	
Window Screens	58 22	
		$13,949 55

Appropriation	$14,500 00	
Amount of Expenses . . .	13,949 55	
Balance unexpended . .	$550 45	

For Public Squares.

Carpenter's Work	$115 36	
Expenses of Flags and Flagstaffs .	105 62	
Forester's Services	900 00	
Freight, &c.	15 80	
Foundations, &c., at Entrances of Common,	176 50	
Hardware and Lead	9 31	
Horse Hire	396 25	
Labor of Men and Horses . . .	1,699 80	
Lumber	19 70	
Ladder	5 00	
Moving and plugging Cannon . .	16 00	
Manure, Loam, and Carting . .	198 07	
Mower	26 80	
Painting Signs	16 20	
Plank Walks	206 90	
Raising and lowering Topmasts . .	45 00	
Seats on Common	7 50	
Trees	135 00	
Tools and Repairs	40 34	
Tarred Paper, Hose, &c. . . .	14 08	
		$4,149 23
Appropriation	$4,200 00	
Amount of Expenses . . .	4,149 23	
Balance unexpended . .	$50 77	

For Salaries of City Officers.

Mayor	$2,500 00
Treasurer	3,000 00
City Clerk	2,000 00
Auditor	1,000 00
City Solicitor	2,000 00
Clerk of Committees	1,500 00
Amount carried forward . .	$12,000 00

Amount brought forward	$12,000 00	
Clerk of Common Council	300 00	
Board of Assessors	6,000 00	
Inspector of Milk	200 00	
Sealer of Weights and Measures	500 00	
Messenger	1,500 00	
		$20,500 00
Appropriation	$20,500 00	
Amount of Expenses	20,500 00	

For Sewers and Drains.

Assessment refunded	$129 11	
Advertising	31 25	
Building Sewers and Cesspools	10,093 58	
Brick	209 25	
Carpenter's Work	49 35	
Gravel	116 00	
Hose	155 00	
Labor	2,499 22	
Lumber and Cement	311 25	
Lanterns, &c.	7 56	
Pipe	1,985 62	
Paving	7 12	
Repairs	1,673 04	
Stone	26 00	
Spikes, Oil, &c.	12 12	
Sand	13 00	
Ventilator	35 55	
		$17,354 02
Appropriation	$25,000 00	
Amount of Expenses	17,354 02	
Balance unexpended	$7,645 98	

For Sewer in Binney Street.

Ballasting Sewer	$8,593 36	
Contractor	57,446 69	
Dredging Broad Canal	640 00	
Inspector	269 50	
		$66,949 55

Appropriation .	$55,000 00		
Additional Appropriations . .	12,000 00		
		$67,000 00	
Amount of Expenses . . .		66,949 55	
Balance unexpended . .		$50 45	

For Sewer in Bridge Street.

Repairs			$79 61
Appropriation		$4,500 00	
Amount of Expenses .	$79 61		
Transferred . .	425 00		
		504 61	
Balance unexpended . .		$3,995 39	

For Sinking-Fund of Water-Works.

Amount paid Trustees of Fund			$41,820 00
Appropriation		$41,820 00	
Amount of Expenses . . .		41,820 00	

For Sinking-Funds.

Amount paid Trustees of Funds . . .			$147,835 00
Appropriation . . .		$147,835 00	
Amount of Expenses . .		147,835 00	

For Stationery and Printing.

Blank Books		$100 38	
Diaries		245 25	
Directories		55 00	
Die for Seal		20 00	
Printing		1,000 56	
Bonds		120 50	
City Documents		986 92	
Voting-Lists		150 00	
Stamps and Envelopes . . .		284 50	
Stationery		348 49	
			$3,311 60

Appropriation	$5,000 00	
Amount of Expenses . . .	3,311 60	
Balance unexpended . .	$1,688 40	

For Streets.

Advertising	$37 50	
Cart	110 00	
Car-Tickets	40 00	
Fuel	82 50	
Gas	70 91	
Gravel and Stone	29,952 01	
Grading Brattle Square . . .	295 22	
Hay, Grain, and Straw . . .	4,088 03	
Horses	625 00	
Horse Blankets	114 00	
Horse Shoeing	893 95	
Harnesses and Repairs . . .	347 57	
Hardware, Tools, &c.	800 02	
Horses, boarding and baiting . .	40 35	
Labor.	45,507 61	
Lumber and Cement	753 32	
Oil, Axle-Grease, &c. . . .	54 57	
Painting and lettering Signs . .	34 00	
Repairs and Iron Work . . .	1,483 53	
Rent of Land for Storage . . .	75 00	
Roller	300 00	
Salary of Superintendent . . .	2,000 00	
Steeling and sharpening Tools . .	743 00	
Sign-Dogs, &c.	5 73	
Stock for Sidewalk	158 20	
Supplies at Stable	19 85	
Stationery	22 04	
Veterinary Services	94 25	
Water-Rates	46 00	
		$88,794 16
Appropriation	$90,000 00	
Amount of Expenses, $88,794 16		
Transferred . . 1,200 00		
	88,994 16	
Balance unexpended . .	$5 84	

For Supply Account of Water-Works.

Castings and Labor		$303 46	
Meters		14 25	
Overcharge refunded		54 00	
Plumbing		162 33	
Supplies		2,710 33	
Sundry Workmen		3,544 53	
Sharpening Tools		137 79	
Tools and Iron Work		144 83	
			$7,071 52
Appropriation		$15,000 00	
Amount of Expenses	$7,071 52		
Transferred	5,000 00		
		12,071 52	
Balance unexpended		$2,928 48	

For Surrendered Estates.

Collecting Rents		$168 50	
Paid for Estates surrendered		42,711 82	
Printing, Advertising, and Posting		29 50	
Repairs, &c.		142 23	
Recording Deeds		8 75	
Tax paid		5 58	
			$43,066 38
Appropriation		$50,000 00	
Amount of Expenses		43,066 38	
Balance unexpended		$6,933 62	

For Text-Books and Stationery for Schools.

Books and Stationery furnished to children		$3,166 89	
Books and Stationery for Schools		406 77	
			$3,573 66
Appropriation		$5,000 00	
Amount of Expenses		3,573 66	
Balance unexpended		$1,426 34	

For Truant Officers.

Services of Officers		$5,500 00
Appropriation	$5,500 00	
Amount of Expenses	5,500 00	

For Unpaid Water-Bills of Previous Years.

Water for Hydrants and Reservoirs	$6,028 00	
Water for watering Streets	11,104 77	
		$17,132 77
Appropriation	18,000 00	
Amount of Expenses	17,132 77	
Balance unexpended	$867 23	

For Volunteers and their Families.

Amount paid to Soldiers' Families		$19,000 00
Appropriation	$21,000 00	
Amount of Expenses	19,000 00	
Balance unexpended	$2,000 00	

For Watering Streets.

Repairs of Carts	$436 50	
Stationery and Printing	20 28	
Superintendent's Salary	337 50	
Water	3,712 87	
Watering	10,483 45	
		$14,990 60
Appropriation	$15,000 00	
Amount of Expenses	14,990 60	
Balance unexpended	$9 40	

For Widening and Extension of Streets.

Dublin Street	$51 00	
Garden Street	827 90	
Hunting Street	91 28	
Amount carried forward	$970 18	

Amount brought forward . .	$970 18	
Main Street	2,072 44	
North Avenue	76 90	
Porter Street	27 00	
Sixth Street	261 00	
Shepard Street	3,430 00	
		$6,837 52

Appropriation	$8,000 00
Amount of Expenses . . .	6,837 52
Balance unexpended . .	$1,162 48

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	Original Appropriations	Added subsequently.	Subtracted subsequently.	Appropriations as altered.	Amount of Expenditures.	Balances unexpended.
Almshouse	$74,000.00	$12,933.95	. . . . .	$86,933.95	$85,469.73	$1,464.22
Cambridge Free Dispensary	1,000.00	. . . . .	. . . . .	1,000.00	1,000.00	. . . . .
Care and Repairs of Bridges	8,000.00	1,200.00	. . . . .	9,200.00	9,194.82	5.18
Care, &c., W. Boston, Craigie's, and Prison Pt. Bridges	20,250.00	. . . . .	. . . . .	20,250.00	8,862.66	11,387.34
Care and Repairs of Schoolhouses	48,000.00	. . . . .	$12,562.47	35,437.53	32,052.43	3,385.10
Care and Repairs of Water-Works	25,000.00	5,000.00	. . . . .	30,000.00	28,586.65	1,413.35
Cemeteries	15,000.00	. . . . .	. . . . .	15,000.00	12,922.17	2,077.83
City Engineering	9,000.00	. . . . .	. . . . .	9,000.00	7,986.83	1,013.17
Compensation of Auditor of School Committee	150.00	. . . . .	. . . . .	150.00	150.00	. . . . .
Compensation of Secretary of School Committee	300.00	. . . . .	. . . . .	300.00	300.00	. . . . .
Dana Library	6,000.00	. . . . .	. . . . .	6,000.00	5,961.51	38.49
Evening Schools for Adults	7,700.00	307.97	. . . . .	8,007.97	8,007.97	. . . . .
Extension of Water-Works	110,000.00	. . . . .	. . . . .	110,000.00	104,143.11	5,856.89
Filling Low Lands	56,501.71	. . . . .	. . . . .	56,501.71	56.501.71	. . . . .
Fire Department	77,000.00	425.00	. . . . .	77,425.00	77,417.21	7.79
Hopkins Fund	900.00	. . . . .	900.00	. . . . .	. . . . .	. . . . .
Incidental Expenses	45,000.00	. . . . .	3,900.00	41,100.00	39,449.18	1,650.82
Instruction in Public Schools	157,100.00	2,218.00	. . . . .	159,318.00	159,318.00	. . . . .
Interest and Bank Discounts	300,000.00	. . . . .	. . . . .	300,000.00	291,118.62	8,881.38
Lighting Streets	21,400.00	966.05	. . . . .	22,366.05	22,366.05	. . . . .
New Schoolhouses and Alterations	700.00	936.50	. . . . .	1,636.50	1,636.50	. . . . .
Paving	20,000.00	. . . . .	. . . . .	20,000.00	19,971.49	28.51
Police and Watch	72,000.00	. . . . .	. . . . .	72,000.00	71,405.53	594.47
Police Court-room, &c., Ward One	14,500.00	. . . . .	. . . . .	14,500.00	13,949.55	550.45
Public Squares	4,200.00	. . . . .	. . . . .	4,200.00	4,149.23	50.77
Salaries of City Officers	20,500.00	. . . . .	. . . . .	20,500.00	20,500.00	. . . . .
Sewers and Drains	25,000.00	. . . . .	. . . . .	25,000.00	17,354.02	7,645.98
Sewer in Binney Street	55,000.00	12,000.00	. . . . .	67,000.00	66.949.55	50.45
Sewer in Bridge Street	4,500.00	. . . . .	425.00	4,075.00	79.61	3,995.39
Sinking-Fund of Water-Works	41,820.00	. . . . .	. . . . .	41,820.00	41,820.00	. . . . .
Sinking-Funds	147,835.00	. . . . .	. . . . .	147,835.00	147,835.00	. . . . .
Stationery and Printing	5,000.00	. . . . .	. . . . .	5,000.00	3,311.60	1,688.40
Streets	90,000.00	. . . . .	1,200.00	88,800.00	88,794.16	5.84
Supply Account of Water-Works	15,000.00	. . . . .	5,000.00	10,000.00	7,071.52	2,928.48
Surrendered Estates	. . . . .	50,000.00	. . . . .	50,000.00	43.066.38	6,933.62
Text-Books and Stationery for Schools	5,000.00	. . . . .	. . . . .	5,000.00	3,573.66	1,426.34
Truant Officers	5,500.00	. . . . .	. . . . .	5,500.00	5.500.00	. . . . .
Unpaid Water-Bills of Previous Years	18,000.00	. . . . .	. . . . .	18,000.00	17,132.77	867.23
Volunteers and their Families	21,000.00	. . . . .	. . . . .	21,000.00	19,000.00	2,000.00
Watering Streets	15,000.00	. . . . .	. . . . .	15,000.00	14,990.60	9.40
Widening and Extension of Streets	8,000.00	. . . . .	. . . . .	8,000.00	6,837.52	1,162.48
Amount of Appropriations	$1,570,856.71	. . . . .	. . . . .	$1,632,856.71	$1,565,737.34	$67,119.37
Amount of Expenditures	. . . . .	. . . . .	. . . . .	1,565,737.34		
Balances unexpended	. . . . .	. . . . .	. . . . .	$67,119.37		

The appropriation for Hopkins Fund was transferred to Instruction in Public Schools. The creation of a City Debt of $50,000 was authorized for Surrendered Estates, and of $12,000 for Sewer in Binney Street, subsequent to the annual appropriations.

Dr. JOSEPH WHITNEY, TREASURER,

1875.			
Dec. 1.	Balance on hand		$115,579.25
	Of sundry Persons, Interest on Taxes and Assessments on Estates sold to the City, and released, and for Recording Deeds		384.82
	Samuel James, Amount of Duplicate Bill refunded		13.79
	G. W. Lamson & L. C. Clark, Rent of Tenements in City Building, Central Square		354.00
	P. B. Cloyes, Rent of Engine House, Church Street		35.00
	C. E. Otis, for Stone and Gravel from Almshouse Ledge		1,478.59
	P. H. Raymond, Chief Engineer, proceeds of Sale of old Stove	$6.00	
	" " " " " Carpets	12.00	
	" " " " " Hose	1.00	
	" " " " " Manure	94.00	
			113.00
	W. S. Swan, for Plank Walk, Cambridge Common		.70
	Trustees Hopkins Charity		920.51
	Bullens & Mixter, Premium on Notes		10.00
	William Muller, Interest on Drain Assessment		82.35
	Sundry Persons, Tuition at High School		150 00
	H. D. Yerxa, for Hay		20.37
	Ezra Parmenter, Bridge Commissioner, Rent of Pier and Tenement	$75.00	
	" " " Proceeds of Sale of old Junk	4 00	
			79.00
	J. R. Fairbairn, Rent of Surrendered Estates		405.26
	John Hillery, Interest on Note		23.00
	J. A. Jacobs, City Clerk, Junk Licenses	$455.00	
	" " Circus "	100.00	
	" " Auctioneers' Licenses	42.00	
	" " Pawnbrokers' "	4.00	
	" " Billiard "	4.00	
	" " Junk Store "	2.00	
	" " Intelligence Office License	1.00	
			608.00
	Commissioners of Sinking-Funds of the City, Interest on Temporary Loan		1,205.10
	C. E. Otis, on account of Weighing Fees		75.00
	George H. Copeland, Chief of Police, Use of Ropes and Stakes		10.00
	County of Middlesex, Rent of Police Court Room		350.00
	" " Dog Licenses refunded		2,606.40
	State of Massachusetts, Corporation Tax	$28,404.23	
	" " National Bank Tax	20,148.61	
	" " State Aid	16,000.00	
	" " Armory Rents	1,078.00	
			65,630.84
	Joseph Whitney, Collector, Taxes of 1870	$7.00	
	" " " 1871	7.80	
	" " " 1872	172.00	
	" " " 1873	855.70	
	" " " 1874	33,764.38	
	" " " 1875	91,718.80	
	" " " 1876	814,175.29	
	" " Interest on Taxes	5,874.40	
			946,575.37
	J. K. Farwell, Supt., Account of Cambridge Cemetery		9,759.46
	Overseers of the Poor " " Almshouse		9,215.53
	A. L. Hayward, Librarian, Account of Dana Library		171.43
	T. McIntire, Clerk, Account of Police Court		4,889.33
	Cambridge Water-Works, Rates, Supplies, &c		187,402.53
	W. H. Dodge, Weighing Fees		44.30
	Sundry Persons, Betterment Assessments		410.78
	" " Watering Streets		7,933.78
	" " Liquor Licenses		17,950.00
	" " Paving Assessments		1,131.03
	" " Drain Assessments		10,636.87
	" " Grading Assessments, Washington Street District		9,963.69
	" " " " Miller's River District		29,041.89
	" " " " Cowperthwaite St. District		390.45
	" " " " Cambridge Street District		2,954.47
	" " " " Sparks Street District		136.31
	Interest on Grading Assessments, Washington Street District		937.75
	" " " Cambridge Street District		70.22
	" " " Cowperthwaite Street District		4.99
	Howe Estate, Nuisance Assessment		146.75
	James Dillaway, care of Lot Cambridge Cemetery		150.00
	Sale of City Bonds, Sewer Loan		94,885.50
	" " Water Loan		116,884.35
	" " Street Widening Loan		7,255.00
	" " Low Land Loan		62,103.75
	Accrued Interest on Bonds, Sewer Loan		1,947.66
	" " " Water Loan		266.67
	" " " Street Widening Loan		150.00
	" " " Low Land Loan		1,293.00
	Proceeds of Sales of Real Estate		7,635.00
	Sundry Persons and Institutions, Temporary Loan		726,000.00
	J. Hillery's Note given up		214.23
	J. P. Squire's " "		5,466.67
	J. P. Squire's " "		20,146.51
	J. Pike's " "		1,527.00
			$2,475,827.25

IN ACCOUNT WITH THE CITY OF CAMBRIDGE. *Cr.*

1875.		
Dec. 1.	By paid State of Massachusetts, State Tax	$58,580.00
	" " Bank Tax	6,906.53
	" " under the Provisions of the Act to regulate the Sale of Intoxicating Liquors	4,487.50
	County of Middlesex, County Tax	37,580.73
	Sundry Persons, per Mayor's Drafts and Orders	1,287,744.62
	" " and Institutions, Temporary Loan	726,000 00
	" " Interest " "	15,222.37
	" " " Permanent Loan	275,896.25
	J. P. Squire's Notes	28,466.67
	R. H. Oliver's "	150.00
	J. Pike's Bond	7,635.00
	Balance on hand	27,157.58
		$2,475,827.25

JOS. WHITNEY, *Treasurer.*

ACCOUNT OF CITY DEBT, DECEMBER 1, 1876.

Date.	Rate.	To whom payable.	Amount.	Total.	When payable.	Interest paid to
April 6, 1857.	5¾	Lowell Institution for Savings	$30,000.00		April 6, 1877.	Oct. 6, 1876.
July 1, 1858.	5	Cambridge City Bonds	7,000.00		July 1, 1878.	July 1, 1876.
July 1, 1859.	5	" "	15,000.00		July 1, 1879.	July 1, 1876.
Aug. 1, 1862.	5	" "	30,000.00		Aug. 1, 1882.	Aug. 1, 1876.
Sept. 10, 1862.	5	" "	40,000.00		Sept. 10, 1882.	Sept. 10, 1876.
Sept. 10, 1862.	5	" "	30,000.00		Sept. 10, 1877.	Sept. 10, 1876.
Nov. 20, 1862.	5	" "	14,000.00		Nov. 20, 1882.	Nov. 10, 1876.
Mar. 5, 1863.	5	" "	150,000.00		Jan. 1, 1893.	July 1, 1876.
April 1, 1864.	5	" "	100,000.00		April 1, 1889.	Oct. 1, 1876.
July 1, 1870.	6	" "	20,000.00		July 1, 1890.	July 1, 1876.
July 1, 1871.	6	" "	100,000.00		July 1, 1861.	July 1, 1876.
July 1, 1871.	6	" "	100,000.00	$636,000.00	July 1, 1886.	July 1, 1876.
July 1, 1856.	6	Water Loan: Cambridge City Bonds	50,000.00		July 1, 1881.	July 1, 1876.
May 1, 1865.	6	" " "	300.00		May 1, 1875.	May 1, 1875.
Aug. 1, 1865.	6	" " "	55,000.00		Aug. 1, 1883.	Aug. 1, 1876.
July 2, 1866.	6	" " "	100,000.00		July 2, 1886.	July 2, 1876.
April 1, 1867.	6	" " "	150,000.00		April 1, 1887.	Oct. 1, 1876.
April 1, 1868.	6	" " "	175,000.00		April 1, 1888.	Oct. 1, 1876.
May 1, 1869.	6	" " "	112,000.00		May 1, 1889.	Nov. 1, 1876.
July 1, 1870.	6	" " "	60,000.00		July 1, 1890.	July 1, 1876.
May 1, 1871.	6	" " "	50,000.00		May 1, 1891.	Nov. 1, 1876.
Mar. 20, 1873.	6	" " "	335,000.00		July 1, 1892.	July 1, 1876.
April 1, 1874.	6	" " "	150,000.00		July 1, 1894.	Oct. 1, 1876.
April 1, 1875.	6	" " "	157,000.00		April 1, 1895.	Oct. 1, 1876.
April 1, 1875.	6	" " "	3,000.00		April 1, 1895.	Oct. 1, 1876.
July 1, 1876.	6	" " "	103,000.00	1,500,300.00	July 1, 1896.	
Mar. 20, 1873.	6	Funding Loan: Cambridge City Bonds	215,000.00		July 1, 1883.	Oct. 1, 1876.
July 1, 1874.	6	" " "	100,000.00		July 1, 1884.	July 1, 1876.
July 1, 1875.	6	" " "	24,000.00	339,000.00	July 1, 1885.	July 1, 1876.

Mar. 20, 1873.	6	Paving Loan: Cambridge City Bonds	100,000.00		July 1, 1893.	July 1, 1876.
July 1, 1874.	6	" " "	130,000.00		July 1, 1894.	July 1, 1876.
July 1, 1875.	6	" " "	25,000.00		July 1, 1895.	July 1, 1876.
				255,000.00		
July 1, 1873.	6	Sewer Loan: Cambridge City Bonds	136,000.00		July 1, 1903.	July 1, 1876.
July 1, 1874.	6	" " "	295,000.00		July 1, 1904.	July 1, 1876.
July 1, 1875.	6	" " "	104,000.00		July 1, 1905.	July 1, 1876.
July 1, 1875.	6	" " "	40,000.00		July 1, 1905.	July 1, 1876.
Oct. 1, 1875.	6	" " "	20,000.00		Oct. 1, 1895.	Oct. 1, 1876.
July 1, 1876.	6	" " "	29,000.00		July 1, 1896.	
				624,000.00		
July 1, 1873.	6	Street Widening Loan: Cambridge City Bonds	10,000.00		July 1, 1903.	July 1, 1876.
July 1, 1874.	6	" " " "	90,000.00		July 1, 1904.	July 1, 1876.
July 1, 1875.	6	" " " "	14,000.00		July 1, 1905.	July 1, 1876.
July 1, 1876.	6	" " " "	7,000.00		July 1, 1886.	
				121,000.00		
July 1, 1873.	6	Building Loan: Cambridge City Bonds	119,000.00		July 1, 1883.	July 1, 1876.
April 1, 1874.	6	" " "	198,000.00		April 1, 1884.	Oct. 1, 1876.
July 1, 1875.	6	" " "	17,000.00		July 1, 1885.	July 1, 1876.
				334,000.00		
July 1, 1873.	6	Street Loan: Cambridge City Bonds	13,000.00		July 1, 1893.	July 1, 1876.
				13,000.00		
July 1, 1873.	6	Land Loan: Cambridge City Bonds	10,000.00		July 1, 1893.	July 1, 1876.
				10,000.00		
July 1, 1872.	6	Low Land Loan: Cambridge City Bonds	15,000.00		July 1, 1882.	July 1, 1876.
July 1, 1873.	6	" " "	271,000.00		July 1, 1883.	July 1, 1876.
April 1, 1874.	6	" " "	240,000.00		April 1, 1884.	Oct. 1, 1876.
Oct. 7, 1874.	6	" " "	56,000.00		Oct. 1, 1884.	Oct. 1, 1876.
July 1, 1875.	6	" " "	122,000.00		July 1, 1885.	July 1, 1876.
July 1, 1876.	6	" " "	60,000.00		July 1, 1886.	
				764,000.00		
July 1, 1874.	6	Bridge Loan: Cambridge City Bonds	94,000.00		July 1, 1884.	July 1, 1876.
July 1, 1875.	6	" " "	26,000.00		July 1, 1885.	July 1, 1876.
				120,000.00		
Oct. 1, 1863.	6	Trustees Daniel White Charity	5,000.00			Oct. 1, 1876.
June 1, 1858.	6	Trustees Dowse Institute Fund	10,000.00			June 1, 1876.
Oct. 8, 1864.	6	Trustees Sanders Temperance Fund	10,000.00			Oct. 8, 1876.
				25,000.00		
		State Tax	62,586.00		Dec. 1, 1876.	
		County Tax	21,840.47		Dec. 31, 1876.	
				84,426.47		
				$4,825,726.47		

REPORT

OF THE

COMMISSIONERS OF THE SINKING-FUNDS OF THE CITY.

To the Honorable City Council: —

The undersigned, Commissioners of the Sinking-Funds of the City, in accordance with Section 8 of an Ordinance in relation to Sinking-Funds, passed Dec. 22, 1875, herewith respectfully submit their first Annual Report.

Under this ordinance, the Board was duly organized Jan. 7, 1876, and received from the City Treasurer the following assets constituting the Sinking-Funds, Dec. 1, 1875; viz.: —

Bonds of the City of Cambridge (447 of $1,000 each), costing	$461,080 00
Accrued Interest on above, unpaid Dec. 1 .	11,159 67
Cash on hand	190 61
Total Amount of Funds, Dec. 1, 1875 .	$472,430 28

It will be perceived that the above $447,000 of bonds had cost $461,080.00, or $14,080.00 above par; and, as the market-price would enable this excess to be realized by a sale, the matter of disposal of at least a portion equal to the amount of City Debt maturing July 1 ($100,000.00) was at once considered, and legal advice taken. It was found, that, under the "Statute of 1875 relating to Municipal Indebtedness," all bonds of our city must be stamped or cancelled against negotiation, as soon as they have become a part of said funds, and that the Board had no authority to dispose of any by a sale. Accordingly we immediately caused all bonds in our possession to be plainly stamped upon their face with the words, "A Part of the Sinking-Funds of the City of Cambridge, and not negotiable." The Commissioners found themselves obliged to take this action, the

effect of which rendered the bonds in the future unavailable for the purchase of maturing bonds of the city, and reduced their value to par, and the funds by the amount of the excess of $14,080.00 (the cost), which amount has been charged off as premium paid from the funds.

The following represents the present condition of the funds; viz.: —

Amount of Assets received as above at cost, less Accrued Interest unpaid Dec. 1, 1875		$461,270 61
Less Premium paid over par, now extinguished by complying with the Statute of 1875		14,080 00
Leaving Amount of Funds, Jan. 11, 1876		$447,190 61
Received Interest on the Funds for the year		27,018 00
Received from the City under the Ordinance relating to the Sinking-Funds, passed Dec. 22, 1875		147,835 00
Total Assets for the year		$622,043 61
Less Amount paid City Debt due July 1, 1876	$100,000 00	
Paid City of Cambridge Interest for Amount advanced July 1, to Nov. 30, 1876	1,205 10	
Paid Accrued Interest on Bonds purchased Nov. 30, 1876	1,011 33	
		102,216 43
Total Amount of Funds, Dec. 1, 1876		$519,827 18
Accrued Interest on Funds, Dec. 1, 1876, payable Jan. 1		12,118 67
Actual Value of Funds, Dec. 1, 1876		$531,945 85
Said Fund is invested as follows; viz.: —		
Bonds of the City of Cambridge (at par)	$488,000 00	
Notes secured by Mortgage	20,146 51	
Cash on hand	11,680 67	
		$519,827 18

The funds already represent sixteen per cent of the city debt

proper. The Commissioners would call attention to the difficulty of obtaining good securities for their investment, under the restrictions of the Statute of 1875, that will earn six per cent, or the amount required for these funds; as all first-class city bonds now command a premium of from six to ten per cent above par, and consequently preclude their purchase by the Board. We believe the funds should be invested wholly, if possible, in our own bonds for security and safety, rather than in securities over which we can have no control. It is already an admitted principle of finance, "that a sinking-fund may be best invested in the same description of securities as those which it is established to cancel. In such case, the institution of the sinking-fund amounts to and becomes a particular engagement to contribute a certain sum, by annual taxation, towards the extinction of the debt. Such an agreement gives additional strength and confidence to the financial operations of cities and towns when they wish to borrow." If the above principle is the correct one, it follows, that, in the future issues of bonds of our city, a portion certainly should be offered to the Commissioners for their investment, to obviate the difficulty above named, especially as but a small amount of the city debt will become due until 1881, and consequently the accumulation for investment will be largely increased. Great care will be required to invest the funds, in order to be able to earn the required six per cent, and to keep the funds so invested that the amount of debt annually maturing may be met from the proceeds. Whether, under the Statute of 1875, it will be possible to do this without some modification, is a matter of doubt which the future will determine. At any rate, the main features of this statute are timely and healthful, and will tend largely to strengthen the credit of our muncipalities, and afford greater facilities and ability to pay off all present as well as future indebtedness.

All which is respectfully submitted.

CHAS. H. SAUNDERS,
JOHN M. TYLER,
SAM'L SLOCOMB,
ROBT. DOUGLASS,
JOS. A. HOLMES,
WALTER S. BLANCHARD,

Commissioners of the Sinking-Funds of the City.

CAMBRIDGE, Dec. 21, 1876.

REPORT

OF THE

TRUSTEES OF THE SINKING-FUND OF THE CAMBRIDGE WATER-WORKS.

The undersigned, Trustees of the Sinking-Fund of the Cambridge Water-Works, respectfully submit the following Report: —

Amount of Fund, June 30, 1875		$132,581 71
Received of City of Cambridge, under the Provisions of an Ordinance passed Oct. 4, 1876	$41,820 00	
Accrued Interest on Water Bonds sold,	1,166 67	
Interest on Fund	7,570 45	
		50,557 12
		$183,138 83
Water Loan of 1865, paid in part		6,000 00
		$177,138 83
Accrued Interest on Fund		2,302 50
Value of Fund, June 30, 1876		$179,441 33

The Fund is invested as follows: —

Cambridge Water Bonds, par value $177,300.00	$176,803 75	
Temporary Loan to the City	335 08	
	$177,138 83	

ISAAC BRADFORD,
FRANK A. ALLEN,
JOS. WHITNEY,
Trustees of Sinking-Fund of the Water-Works.

CAMBRIDGE, June 30, 1876.

REPORT

OF THE

JOINT STANDING COMMITTEE ON PUBLIC PROPERTY.

THE Joint Standing Committee on Public Property submits the following

SCHEDULE OF PROPERTY

owned by the city at the close of the year ending Dec. 31, 1876: —

ALMSHOUSE BUILDING.

Foot of Tannery Street, Ward 5. Also 12.688 acres of land in Cambridge, and 18.870 acres of land in Somerville. Also stone ledge.

CEMETERIES.

Cambridge Cemetery. Foot of Coolidge Avenue, containing 40.8129 acres of land.

Burial Ground. Garden Street, junction North Avenue, containing 77,452 square feet of land.

COMMONS AND PUBLIC SQUARES.

Cambridge Common. Garden Street, North Avenue, and Waterhouse Street. Area about 359,936 square feet.

Public Square. Between Waterhouse Street and North Avenue. About 13,112 square feet.

Public Square. Garden and Chauncy Streets, and Concord Avenue. Area about 3,337 square feet.

Public Square. Between Waterhouse Street and North Avenue. Contents about 340 square feet.

Public Square. Between Holmes Place and Cambridge Street. Contents about 15,664 square feet.

Public Square. North Avenue, corner of Kirkland Street, on south corner. Contents about 23,243 square feet.

Public Square. North Avenue, corner of Kirkland Street, on north corner. Contents about 32,080 square feet.

Common. Junction Broadway and Main Street. Contents about 1,539 square feet.

Common. Broadway, corner of Norfolk Street. Contents about 102,814 square feet.

Fort Washington. Waverley Street. Contents of land about 42,023 square feet.

Common. Junction of Pleasant and River Streets. Contents about 7,554 square feet.

Hastings Square. Brookline, Chestnut, and Henry Streets. Area about 30,000 feet.

Dana Square. Lake, Magazine, Lawrence, and Niagara Streets. Area about 33,543 square feet.

Winthrop Square. Brighton, Winthrop, and Mt. Auburn Streets, containing about 11,802 square feet.

Public Square. In front of Universalist church, junction of Main and Front Streets. Area 1,800 feet.

CITY LANDS.

Lot on Franklin, Auburn, and Sydney Streets, containing about 80,000 feet.

Lot on Auburn, Pilgrim, and Sydney Streets, containing about 84,732 feet.

Lot on Sydney Street, east side, near Auburn Street, containing about 26,034 feet.

Lot on Cambridge, corner Portland Street, containing about 111,626 feet.

Lot, junction of Arrow and Main Streets, containing about 717 feet.

Lot, junction of Hampshire Street and Broadway, containing about 591 feet.

Lot on Sixth Street. East, west, and rear lots on South Dock and South Canal. About 9,546 square feet.

Gravel Pit in Belmont, Concord Avenue, containing about 471;148 square feet.

CITY BUILDINGS.

Ward One Building, Brattle Square, and land containing about 13,066.5 square feet.

Ward Four Building, junction Western Avenue and Green Street, and about 25,765 square feet of land.

City Hall, Main Street, corner Pleasant Street, and about 8,914 square feet of land.

City Stables, Norfolk, Hampshire, and Tremont Streets, and about 51,280 square feet of land.

ENGINE-HOUSES.

House No. 1, Eliot Square, corner Mt. Auburn Street, and land, about 16,146.5 feet.

House No. 2, Main Street, near Windsor, and land, about 3,444 feet.

House No. 3, Gore and Fourth Streets, and land, about 6,969 feet.

House No. 4, North Avenue, near corner Russell Street, and land, about 2,872 feet.

House No. 5, Hampshire Street, corner Inman Street, and land, about 6,000 feet.

House, Old, junction Western Avenue and River Street, and land, about 2,035 feet.

DRINKING-FOUNTAINS.

Fifteen Fountains for persons and animals.

Two Fountains for persons only, located in different parts of the city.

SCHOOLHOUSES.

Allston, Boardman Street. About 15,152 feet of land.

Agassiz, Oxford Street, corner Sacramento Street. About 19,707 feet of land.

Boardman, Windsor Street, corner School Street. About 10,018 feet of land.

Bridge, Pioneer Street, Lower Port, about 4,471 feet of land.

Dunster, Concord Avenue, near Sparks Street, and about 10,000 feet of land.

Dana, Centre Street, and about 14,317 feet of land.

Felton, Amory Street, corner Summer Street, and about 15,000 feet of land.

Gore, Gore Street, between Third and Fourth Streets, and about 9,900 feet of land.

Gannett, Columbia Street, between Lincoln and Cambridge Streets, and about 8,806 feet of land.

High School, Fayette Street, Antrim Street, and Broadway, and about 37,824 feet of land.

Harvard, Broadway, corner Inman Street, and about 20,678 feet of land.

Harvard (Primary), Harvard Street, near Prospect Street, and about 10,000 feet of land.

Holmes, Hilliard Street, and about 11,182 feet of land.

Mason, Front Street, corner Jennings Street, and about 10,000 feet of land.

Otis, Otis Street, between Fifth and Sixth Streets, and about 8,095 feet of land.

Putnam, Otis Street, corner Fourth Street, and about 10,000 feet of land.

Quincy, Mason Street, corner James Street, and about 10,000 feet of land.

Reed, Reed Street, Ward 5. About 12,000 feet of land.

Riverside, Putnam Avenue, Ward One. About 11,200 feet of land.

Sargent, Broadway, corner Windsor Street. About 9,546 feet of land.

Shepard, North Avenue, near Russell Street. About 14,807 feet of land.

Thorndike, Thorndike Street, corner Sixth Street. About 10,000 feet of land.

Willard, Lake, Lawrence, and Niagara Streets. About 20,054 feet of land.

Webster, Upton Street. About 25,765 feet of land.

Wyman, Spruce Street, corner Groveland Street. About 15,000 feet of land.

Washington, Brattle Street, corner Farwell Place. About 14,789 feet of land.

SURRENDERED ESTATES.

These estates have been surrendered to the city under the provisions of the statutes relating to lowland filling.

This list gives by whom surrendered, and place where located.

Cambridge Street District.

Blanchard, W. S. Jefferson Street. House, and about 1,756 feet of land.

Donnelly, James, Heirs of. Hunting and Harding Streets. House, and about 4,031 feet of land.

Horigan, Jeremiah. Warren Street. House and block in rear (2 houses). About 6,510 feet.

Langley, Samuel. Hunting and Harding Streets. House and about 1,678 feet of land, Hunting Street; house and about 1,521 feet of land, Harding Street; house and about 1,442 feet of land, Harding Street.

Madden, D. & H. A. Willow and Harding Streets. House, and about 6,064 feet land.

Nourse, Susan M. Porter and Jefferson Streets. House, and about 1,683 feet of land, Porter Street; lot of land, 7,746 feet, Porter Street; lot of land, 11,202 feet, Porter and Jefferson Streets.

Rafferty, B. Cambridge and Jefferson Streets. Old building, and about 24,955 feet of land.

Taunton Savings Bank. Corner McCabe and Jefferson Streets. Block of 3 houses, and about 3,375 feet of land, McCabe and Jefferson Streets; block of 3 houses, and about 2,600 feet of land, McCabe Street.

White, Rufus A. Jefferson Street. House, and about 1,463 feet of land.

Miller's River District.

Dale, Thomas J. Rear of Winter Street. 3 old buildings, and about 5,320 feet of land.

Davies, Benjamin F. Rear of Gore Street. Lot of land containing about 16,428 square feet.

Moulton, H. & C. W. H. Rear Gore Street. Lot of land containing about 17,575 square feet.

Tibbetts, Israel. Bridge Street. Lot of land containing about 3,765 feet.

Wellington, Joseph A. Rear Winter Street, on North Fifth Street. ¾ stable, and about 8,340 feet, west side North Fifth Street; lot of land about 7,200 feet, east side North Fifth Street.

Cowperthwaite Street District.

Crane, Ann, Heirs of. Grant Street and DeWolf Street. Lot of land containing about 16,350 square feet.

Kneeland, Henry. Grant and Cowperthwaite Streets. House and about 4,000 feet on Cowperthwaite Street; lot of land, 4,000 feet, on Grant Street.

Lynch, Ann. Cowperthwaite Street. 2 houses and about 4,000 feet of land.

Winthrop, William, Heirs of. Athens Street. Lot of land, west side, 6,750 feet; lot of land, east side, 20,360 feet.

Sparks Street District.

Bancroft, George. Estates on Mt. Auburn and Willard Streets. Double house, 185 and 187 Mt. Auburn Street, and about 3,360 feet; double house, 197 and 199 Mt. Auburn Street, and about 2,870 feet; double house, 31 and 33 Willard Street, and about 3,080 feet; double house, 35 and 37 Willard Street, and about 3,080 feet; double cottage, 4 and 6 Dinsmore Court, and about 1,613 feet; double cottage, 8 and 10 Dinsmore Court, and about 1,613 feet.

Bancroft, George. Dinsmore Court. Double cottage, Nos. 12 and 14, and about 1,613 feet of land; double cottage, Nos. 13 and 15, and about 1,613 feet of land.

Washington Street District, South Dock and South Canal.

Bent Heirs. Dock and Sixth Streets; east lot containing 5,224 feet; west lot containing 7,699 feet; rear lot containing 29,482 feet.

WHARVES AND LANDINGS.

Public Landing, foot of Bath Street, area unknown. *Public Landing*, south of Mount Auburn Street, area unknown.

City Wharf, Main Street, opposite Harvard Street. About 13,711 square feet.

WATER-WORKS PROPERTY.

Old Engine House, foot of Lakeview Avenue, and about 37,640 feet of land.

New Engine House, opposite foot of Lexington Avenue, and about 43,560 feet of land.

Fresh Pond, lands bordering on, area unknown.

Little Pond, lands bordering on, area unknown.

Reservoir, Reservoir Street, corner High Street, and 84,168 feet of land.

RECAPITULATION OF AREAS.

		Feet.	Acres.
Almshouse Lands			31.558
Cemetery Lands			42.591
Commons		678,787 or	15.583
City Lands		313,246	
Occupied by City Buildings		99,025.5	
Occupied by Schoolhouses		358,313	
Occupied by Engine Houses		37,466.5	
Surrendered Land:—			
Cambridge Street District	77,026		
Miller's River District	58,628		
Cowperthwaite District	55,460		
Sparks Street District	18,842		
Washington Street District	42,405		
		252,361	
Occupied by Water-Works, exclusive of lands bordering on Fresh and Little Ponds		165,368	
City Wharf		13,711	
Included in Almshouse, Cemetery, and Common Lands			89.732
Other Lands occupied by Buildings, or vacant		1,239,491	

REPORT

OF THE

COMMISSIONERS OF THE CAMBRIDGE CEMETERY.

To the City Council: —

The Commissioners of the Cambridge Cemetery herewith submit their Twenty-second Annual Report, for the year ending Nov. 30, 1876.

The receipts for the year have been as follows: —

Cash received for Burial Lots	$4,970 00	
Cash received for Care of Lots	2,573 03	
Cash received for Burial Fees	1,369 50	
Cash received for Foundations	333 50	
Cash received for Brick Graves	157 00	
Cash received for Granite Posts	276 68	
Cash received for Hay	74 00	
Cash received for Wood	5 75	
		$9,759 46

The expenditures for the year have been as follows: —

Superintendent's Salary	$1,500 00	
Sundry Workmen	8,082 19	
Grading and Sodding	915 60	
Sods and Manure	780 87	
Trees, Plants, and Seeds	296 00	
Stone Posts	731 90	
Superintendent of Old Grounds, Ward One	12 00	
Other Expenses	603 61	
		12,922 17
Excess of Expenditures		$3,162 71
Total Appropriation for the year	$15,000 00	
Total Expenditure for the year	12,922 17	

The money deposited with the City Treasurer by owners of lots, for the care of the same, in accordance with the ordinance, amounts to $1,050.00, on which there is due $100.49 for interest.

The number of lots prepared and now ready for sale is 58; and the number of lots sold, 44.

Whole number of interments for the year, 505; being 76 less than for the year previous; making the whole number of interments in the Cemetery 9,444.

The cash received for burial lots has been $3,800.00 less in amount than the average annual receipts for the preceding four years; which sufficiently accounts for the deficit above represented. A reduction has been made in the allowance to the Superintendent, and the wages of the workmen; and the number of workmen has been kept as low as the absolute needs of the Cemetery would permit. The work on the filling of the basin in front of the Lodge has been completed by grading and sodding the same; and your Commissioners feel that the appearance of the Cemetery just within the entrance to the grounds is much improved thereby.

The Superintendent still continues to exercise the same judicious care which he has always displayed.

ISAAC BRADFORD,
JOHN M. TYLER,
CURTIS DAVIS,
GEO. S. SAUNDERS,
GEO. T. GALE,
WILLIAM PAGE,
GEORGE R. BRINE,

Commissioners of the Cambridge Cemetery.

REPORT

OF THE

COMMITTEE ON SOLDIERS AND THEIR FAMILIES.

THE Joint Committee on Soldiers and their Families submits to the City Council its Report for the year ending Nov. 30, 1876.

The whole Number of Cases in which Aid has been granted during the year is	286
The Number now on the List is	273
The Appropriation for Volunteers and their Families was	$21,000
The Amount paid from said Appropriation to Nov. 30, as appears by the books of the Auditor, was . .	$19,000

The payments of State Aid, as returned to the Auditor of the Commonwealth, are for the year ending Dec. 31, 1876, and amount to $19,756.00, of which sum $18,468.50 will be re-imbursed to the City by the State. The monthly payments now amount to about $1,600.00 ; and an appropriation of $20,000.00 will be sufficient for the ensuing year.

All which is respectfully submitted.

S. H. SANBORN,
JEREMIAH MURPHY,
BENJAMIN DOW,
ISAAC A. NAY,
} *Committee on Soldiers and their Families.*

DEC. 20, 1876.

REPORT

OF THE

BOARD OF OVERSEERS OF THE POOR.

To the Honorable the City Council of the City of Cambridge: —

The Overseers of the Poor respectfully submit their Annual Report to the City Council for the financial year ending Nov. 30, 1876.

Appropriation made by the City Council at the beginning of the year	$74,000 00
Additional Appropriation	13,000 00
	$87,000 00
Transferred	66 05
	$86,933 95
Amount of Expenses	85,469 73
Balance unexpended	$1,464 22

Receipts from the various departments of the Almshouse have been as follows: —

From House Offal Department	$4,728 55	
From Cities and Towns	3,396 22	
From State	10 00	
For Board	551 25	
For Sundry Small Items	40 75	
From Farm and Ledge	537 88	
		$9,264 65
Due from State	$249 31	
Due from Cities and Towns	807 76	
		$1,057 07

EXPENDED FOR ALMSHOUSE DEPARTMENT.

For Salaries and Help of all Description, and Expressing	$9,665 24	
Groceries, Meats, and Fish	8,418 35	
Dry-Goods, Clothing, Boots, and Shoes	3,406 52	
Fuel, Gas, and Water	3,181 18	
Bread for the Almshouse	2,751 81	
Repairs on Buildings, New Fence, Hardware, and Farming Tools,	3,111 33	
Grain for Horses and Cows	1,232 35	
Carriage Work, Harnesses, Repairs on Swill Wagons, and Horse-Shoeing	1,582 31	
Medicines and Burial Bills	410 09	
Furniture, Wares, and Fixtures	621 21	
Sabbath School Books, Papers, and Chaplain	250 08	
Horses and Cows, and Manure for Farm	627 43	
Stationery, Car-Tickets, and postage	94 25	
Sundry Items not classified	115 35	
		$35,467 50

EXPENDED BY THE OVERSEERS OUTSIDE.

For Groceries, Fuel, Boots and Shoes, Rents, Medicines, Doctors' Bills, and Transportation of Paupers to other Cities and Towns	$36,232 95	
Support at State Institutions	7,624 93	
Burial of Paupers, part of which is charged to other Cities and the State	1,145 80	
Bills paid other Cities and Towns for Paupers having Settlement in Cambridge	3,914 92	
Amount carried forward	$48,918 60	

Amount brought forward . .	$48,918 60	
Clerk's Salary, and Office Expenses, and Car-Tickets for Overseers	708 18	
Other Items not classified . .	375 45	
		$50,002 23

EXPENSES OF THE HOUSE OFFAL DEPARTMENT.

For Pay Roll of Men employed . .	$4,778 50	
Board of Horses . . .	1,248 00	
Repairs on Harnesses and Wagons, and Horse Shoeing . .	965 56	
		$6,992 06
Deducting Receipts for House Offal . . .		4,728 55
Cost to the City for collecting		$2,263 51

The following have been the products of the Farm the past year, with the estimated value of the same: —

800 Bushels Potatoes . . .	$560 00	
50 Bushels Beets	25 00	
450 Bushels Mangel Wurtzel and Turnips	225 00	
50 Bushels Onions . . .	50 00	
100 Bushels Carrots . . .	100 00	
60 Bushels Tomatoes . . .	30 00	
60 Bushels Green Beans . .	60 00	
70 Bushels Peas	70 00	
30 Barrels Squashes . . .	30 00	
2,000 Bunches Asparagus . . .	200 00	
1,500 Cabbages	105 00	
30 Bushels Greens . . .	12 00	
30 Barrels Green Corn . . .	30 00	
3 Tons Rhubarb	30 00	
25 Tons Hay	500 00	
2 Tons Straw	40 00	
		$2,067 00

AMOUNT OF LABOR PERFORMED BY THE PAUPERS.

500 Days' Work on Drains and Fences	$500 00	
600 Days' Work Carpentering	725 00	
200 Days' Work Painting	250 00	
80 Days' Work Mason Work	100 00	
300 Days' Work Cobbling	300 00	
500 Days' Work Teamsters	500 00	
90 Days' Work Swill Teams @ .75,	66 50	
365 Days' Work Stable Work	365 00	
80 Days' Work Whitewashing	80 00	
2,920 Days' Work in House @ .50	1,460 00	
600 Days' Work on Farm	600 00	
		$4,946 50

Average Number of Inmates	180
Number of Permits granted by Overseers for Adults	120
Number of Permits granted by Overseers for Minors	75
Number of Adults sentenced by Police Court	40
Number of Minors sentenced by Police Court	35
Whole Number of Inmates Nov. 28 (males 136, females 70; adults 112, children 94)	206
Whole Number in School (57 Boys, 21 Girls)	78

Estimated cost to the City for food and clothing for the paupers, not reckoning interest on Almshouse Property, and repairs, $1.93 per head per week.

Number of deaths at the Almshouse, 21, — one aged 93, five between 83 and 85, two 75, one 70, two 65, one 56, one 35, two from 1 to 3 years, six under one year.

Most of the labor on repairs and new avenue has been done by the paupers.

The number of inmates has been larger the past year than ever before. The good discipline and sanitary condition of the Institution is due to the efficient Warden and Matron and their associates. There has been no contagious disease in the Institution the past year. Dr. James R. Morse, who has been the Almshouse Physician for a number of years, has performed the duties of that office to the satisfaction of the Board of Overseers and of those who have needed his advice and assistance.

The following Items of Expenditures are not directly under the control of the Overseers, and should be deducted from the expenses of the Almshouse: —

Expenses of the House Offal Department . .	$6,992 06
Amount paid for Burial of State Paupers, and Paupers belonging to other Cities and Towns, and Aid furnished to the same	4,414 92
Amount paid State Institutions	7,624 93
	$19,031 91

All which is respectfully submitted.

BENJ. F. WYETH,
JOSEPH NEWMARCH,
L. B. GUYER,
JOHN W. COVENEY,
GEO. D. CHAMBERLAIN,
S. M. PARSONS,

Overseers of the Poor of the City of Cambridge.

Dec. 12, 1876.

REPORT

OF

JAMES R. MORSE, M.D.,

VISITING PHYSICIAN.

To the Overseers of the Poor of the City of Cambridge:—

Gentlemen, — In accordance with the uniform custom of your Board, it becomes my duty, at the close of the present municipal year, to prepare and forward for your acceptance a brief but comprehensive report of the duties which have been mine to perform, in my care of the sick and infirm, during the current year, as Almshouse Physician; having thereby the care of all those who are the recipients of the city's charity at this institution, whose interests and welfare have been placed in your hands by your fellow-citizens. And you will allow me, at the outset, to suggest that it does not seem necessary or desirable that I should give you in detail a full report of the labor performed, or of the results accomplished, during the present year. I will, therefore, only attempt to present for your consideration a general review of the amount and character of the sickness at the Almshouse, and the success of the efforts made to stay the progress of disease, and to allay the sufferings of those whose diseases are regarded as incurable; for it has now become a well-established fact, that a large proportion of the inmates of this institution, who have passed the age of youth and early manhood, are, when brought here, in an abnormal condition, having some form of chronic disease, which, in many cases, must remain with them as a life-heritage, until they are relieved from the sufferings of earth. The records of the institution show that a large proportion of the fatal cases treated here are of the class regarded as incurable, many of the patients having been

long sick from inherited physiological imperfections, or from specific poisons originating in some pernicious habit of the individuals, or of those that have preceded them. But, without regard to the origin or character of their disease, it seems to be the mission of this institution to give them its safe and comfortable shelter, and the kindly, faithful care which will, as far as possible, relieve their sufferings, and extend to them the assurance of a warm and earnest sympathy.

It affords me great pleasure to be able to report, that, in the performance of my official duties, I have uniformly received the cheerful, kindly aid and sympathy of the Warden and Matron and all their assistants. There has existed a very cordial, friendly feeling between all the officers of the house, and the feeble, suffering poor, who are constantly receiving their aid and assistance. The mutual kindly feeling and unity of effort which have given direction to all our labors in the care of the inmates have contributed largely to the welfare of the many aged and feeble who seem constantly in want of hopeful, encouraging words to strengthen and cheer them while passing through the dark and misty vale. There have been many cases of acute disease under my care during the year, none of them fatal, except some cases of cholera-infantum.

The whole number of deaths is twenty-one, from the following causes: from old age, five; from consumption, four; from cancer, four; from cholera-infantum, four; from marasmus, three; and from Bright's disease, one. Those who have died from old age were ninety-three, ninety, eighty, seventy-eight, and seventy-six years of age respectively. Those who died from cancer were aged as follows: eighty-five, eighty-four, seventy-one, and seventy. The ages of those who died from consumption were eighty, fifty-five, thirty-five, and two years respectively. Those who died from cholera-infantum were aged as follows: one, two, six, and twelve months respectively. Those who died from marasmus were brought to the house as foundlings, while in a condition of extreme debility, either from want of nutriment, or from having been drugged with poisons, and, after a brief, unequal struggle with the elements of decay within them, sank quietly to their mother-earth.

It will be readily seen, from the list of fatal cases, that many who died had lived to an extreme old age, and had been subjected to a life of suffering from disease contracted or inherited, so that they have passed, way-worn and weary, to their final rest. Six cases of confinement have occurred at the house during the present year. All these received the tender, watchful care of the Matron and her assistants, and made a good recovery. There have also been received at the institution seven foundlings, who, when brought to the house, seemed to be objects of pity, — unfortunate waifs cast out into the cold world. Yet the eye of pity and the hand of benevolence, in our goodly city, are ever open to the cry of want and suffering, and the humane heart of those who are selected to care for these innocent ones prompts them to perform their arduous duties with kindness and fidelity.

During the year now closing, as a result of the continuance of the great depression in business affairs, our number of inmates at the house has largely increased: so have my official duties increased in a still larger proportion, and daily visits have almost become a necessity, even if sometimes the number of sick ones is small. I have learned that daily visits often prevent a protracted sickness.

The provision made by our city for the care of the sick poor through the City Dispensary prevents the necessity of my making visits to families out of the house to advise in regard to their removal to this institution for such care as they seem to require.

In closing this Report, permit me to say that the most perfect harmony and kindly feeling has existed in all departments of the institution; and, whenever I have desired aid from others, it has been cheerfully granted at all times, thereby rendering my duties more pleasant. I also desire to express the earnest gratitude of my heart to your Board for your continued confidence, and the many manifestations of personal and official kindness which you have so kindly bestowed upon me.

Respectfully submitted.

J. R. MORSE.

CAMBRIDGE, Dec. 12, 1876.

ANNUAL REPORT

OF THE

CHIEF ENGINEER OF THE CAMBRIDGE FIRE DEPARTMENT,

FOR THE YEAR ENDING NOV. 30, 1876.

CHIEF ENGINEER'S OFFICE, CITY HALL,
CAMBRIDGE, NOV. 30, 1876.

TO HIS HONOR THE MAYOR AND THE HONORABLE CITY COUNCIL OF CAMBRIDGE: —

Gentlemen, — I herewith respectfully present to your Honorable Boards my Sixth Annual Report of the Steam Fire Department of Cambridge.

The Report embraces detailed statements, showing the working force, the number of fires and alarms, the amount of losses and insurance, the names of members and their respective rank, and such other information as may, perhaps, interest you.

MEMBERSHIP.

The force of the department consists of a Chief Engineer, four Assistant Engineers, fourteen members of Steamer Companies, twenty-one members of Hook-and-Ladder Companies, a Relief or Spare Engineer, a Driver of Supply Hose Carriage No. 1, and two Telegraph Operators or Repairers. In the month of April, an ordinance was passed in amendment of the Ordinance in relation to the Fire Department, providing for the reduction of the steamer companies from fourteen men to twelve men, and the hook-and-ladder companies from twenty-one men to seventeen men. Under the operation of this amended ordinance, the vacancies which have occurred in either of the companies have not been filled; so that the

actual working force of the department embraces a roll of 103 men, instead of 121, as previously reported in 1875. Engine Companies Nos. 1, 3, and 4, are now composed of the maximum number of members as required by the new ordinance; but Engine Companies Nos. 2 and 5 each have one more member than the ordinance provides for.

Hook-and-Ladder Companies Nos. 1 and 2 are also in excess of the requisite number; the first-named company having twenty-one men, and the latter-named company having nineteen members, — four in excess in the first case, and two in the second case.

It is the presumption, of course, that these excesses will be lessened at the time of the annual appointments in January next, in order properly to reduce the membership according to the provisions of the amended ordinance.

It was believed, and experience has demonstrated the fact, that the reduction would work no detriment to the efficiency of the service; and no reason can be presented against it. Many cities throughout the country have a less number of men employed in their Fire Departments than is proposed in Cambridge; but such men are permanently employed at reasonable salaries, — a system which will, ere long, obtain in this city. One result of the reduction of the force is the saving of salaries, amounting in the aggregate to $3,650 per annum.

When the new ordinance was framed, it provided that the drivers of the hose-carriages should act as assistant foremen of the steamer companies, — a position which often cannot be filled by them while working at fires, as it is their duty to look after their hose-carriages, and be in attendance to answer all calls for additional hose which may be made upon them.

I would suggest, that, if the salary of the assistant foremen was the consideration which prompted the change ($50 in the aggregate), there could be no possible objection to retaining such officers, without the payment of $10 each in addition to their compensation of $200 per annum as hosemen.

It is highly desirable that there should be two working officers to each company; for it sometimes occurs that the foreman is absent, from sickness or other cause; and it then, if at no other time, becomes requisite to have a second efficient

officer at hand. I trust that the ordinance in this respect may be amended.

THE APPARATUS AND EQUIPMENTS.

The apparatus connected with the service has received the closest attention, in order that it might be at all times in a condition for immediate use. Such repairs have been made from time to time as have been required, and at present all the apparatus is in excellent working condition.

Steamer No. 1 will require some repairs upon its boiler, rendered necessary by defects in a few of the flues. Steamer No. 5, put in service in December, 1874, has required a large outlay for repairs, owing to the shaken condition of the engine, which was purchased in 1863, and which was operated by Steamer Company No. 2, until November, 1873, when a new engine was purchased for that company.

The fact that No. 5 was continually in the repair shop conclusively showed that it would be more economical to purchase a new engine than to expend so much money to keep the old one in fair condition. Therefore an order was passed, Sept. 21, instructing the Chief Engineer, under direction of the Committee on the Fire Department, to purchase a new steam fire-engine to take the place of No. 5. Oct. 5, 1876, the Committee on the Fire Department, accompanied by the Chief Engineer, visited the Amoskeag Manufacturing Company's Works (Manchester, N.H.), where a contract was entered into for the furnishing of a second-class steam fire-engine similar to Steamer No. 2, the contract specifying that it should be delivered, all complete, within six weeks after the signing of the contract. On the fourteenth day of November, the engine was delivered; and, after a thorough test of its capacity in presence of the Committee, it was accepted, and immediately put in service. It has proved itself equal to any work of the manufacturers heretofore received, having been put to a severe test of ten hours' duration at a fire on Bridge Street on the night of Nov. 20. Steamer No. 4 will require some slight repairs, which will be made during the coming winter.

This completes all that may be said of the steam apparatus, unless allusion be made to the proposed repairs upon old No. 5,

in order to secure for the service a spare or relief engine, a valuable adjunct to any fire department. The old No. 3 engine, which has remained in ordinary for three or four years, may be put in serviceable condition at a comparatively small expense by the addition of a new boiler, and some slight changes in the working machinery. If it shall prove expedient, both engines, old Nos. 3 and 5, will be placed in the hands of the Amoskeag Manufacturing Company (the builders) for such repairs as may seem requisite to be made, thus securing for the department two serviceable engines for relief or substitute purposes at such times as it may be necessary to make repairs upon the regular engines in service.

The hook-and-ladder trucks are in good condition, as are also all the appendages connected with them.

The several hose-carriages are in fair condition; but I would again recommend that four-wheeled carriages be procured to take the place of Hose Carriage No. 5, and Supply Hose Carriage No. 1, both two-wheeled vehicles.

These carriages are dangerous to ride upon, and are also more burdensome to the horses employed to drag them than four-wheeled carriages would be.

NEW FIRE APPARATUS.

In my last Report I recommended the purchase of two four-wheeled horse hose-carriages to take the place of the two-wheeled carriages operated by Company No. 5 and the Supply Hose No. 1. An appropriation sufficient to purchase the carriages desired was made by your honorable Boards; and an order authorizing the purchase passed one branch of the City Council, but failed of concurrence in the other. While it was a source of disappointment to those interested, the feeling prevailed that the government would make the desired purchase at no distant day. To continue the present vehicles, imposing as they do the expense of frequent repairs, will be a proceeding far from economical. I would therefore repeat my recommendation for the purchase of the style of carriages named.

While I would not press the purchase of a hook-and-ladder truck, and the formation of a company to take charge of it, the coming year, yet I would say that such an apparatus is needed in Wards One and Five.

The new City Building in Ward One has accommodations for such an apparatus; and it will remain with you to say whether it shall be purchased.

Each of the engine stations, excepting that of Engine 5, is provided with a wagon for the transportation of fuel on occasions of large fires, and for exercising purposes.

Each station should be furnished with one of these wagons; and I would therefore recommend that authority be given for the purchase of one for Engine 5.

The rapidly-growing district known as the Fourth Ward is not so fully protected against fire as its needs demand; and I would recommend to your consideration the practicability of adding another steam fire-engine to the service, with a location midway in that portion of the ward bounded by Main and Brookline Streets, Putnam Avenue, and the river. The large manufacturing establishments known as the Riverside Printing Press and the Dover Stamping Works, the large soap-factories, book-binderies, and other business interests, require more certain protection than is now afforded. The distances from Engine Houses Nos. 1, 2, and 5, to the Riverside Press (Box 42), by actual measurements, and by the nearest routes, are respectively as follows: —

From Engine House No. 1, Brattle Square, through Mount Auburn Street, Putnam Avenue, and Western Avenue, to Riverside Press (Box 42), the distance is 5,250 feet, or $\frac{994}{1000}$ of a mile.

The distance from Engine House No. 2, through Main and River Streets, to the same point, is 5,500 feet, or one mile and $\frac{41}{1000}$.

From Engine House No. 5, through Hampshire, Prospect, and River Streets, to Riverside Press, the distance is 6,750 feet, or one mile and $\frac{278}{1000}$.

To respond to an alarm given at Box 42 from either of the above-named stations would require, on an average, from eight to ten minutes of time, — a condition not existing in any other part of the city where manufacturing is carried on, and where the greater liabilities exist.

The subject is one which the citizens of the ward are interested in, and which is worthy of your attention; and I trust that it will receive the consideration it merits.

FIRES AND ALARMS.

The number of fires and alarms from all causes for the year ending Nov. 30, 1876, has been 104; an increase of 17 over the number reported in 1875. While the department has been frequently called upon, I am happy to say that no serious conflagration has occurred by which more than one building has been destroyed at the same fire.

Dec. 29, 1875, the extensive barrel manufactory of Jaynes & Co., Pacific Street, was burned to the ground. The building, a wooden one, was filled with large quantities of combustible materials, upon which the fire took hold; and, before the district engines could be successfully operated, the entire structure was a mass of flames. A scarcity of water in that section of the city did much to hinder the operations of the firemen; and, even had it been otherwise, there could have been no possibility of saving the structure, as buildings of that description invariably burn when fire once obtains headway in them. The only other fire of importance was that on Bridge Street, on the evening of Nov. 20, 1876, at which time a large manufacturing building of brick was destroyed. The fire, starting in the L part of the building, soon worked its way into the main structure; and, notwithstanding the firemen strenuously labored to arrest the progress of the flames, the latter succeeded in gaining the mastery, and the building became a mass of ruins. A strong north-easterly gale was blowing at the time; and, there being a short supply of water, nothing could be done but to save adjoining property, which was successfully accomplished.

A fire in "Hollis Hall," one of the college buildings, Jan. 26, 1876, caused the destruction of a portion of the roof, and the story beneath the same. The building being a high one, some difficulty was at first experienced in getting streams of water to bear upon the flames; which was, however, finally overcome, and the building was saved. The several other fires during the year have not been of great magnitude; the department reaching the scene of fire so quickly as to prevent a large loss.

While other cities have been visited with serious fires, Cambridge has escaped such calamities, — a fact which proves the

efficiency of the corps intrusted with the responsibility of combating the dangerous enemy.

In this connection I may be pardoned if I again allude to the facilities afforded our firemen, — facilities which enable them to leave their quarters as soon as the first round of the box from which the alarm is given is struck out upon the gongs in the engine-stations.

Appliances, acted upon and controlled by the striking of the fire-alarm, are so arranged in each of the houses as to unloose the horses from their stalls, and allow them to proceed from the stables to their places at the poles or shafts. By these means, particularly in the night-time, the men, upon reaching the floor from their beds, find the horses at their places, waiting to be hitched up; thus effecting a saving of time quite important on the occasion of an alarm of fire.

The introduction of these contrivances has been attended with some, but not an extravagant, expense.

CIRCULATING HEATERS.

The circulating heaters, mention of which has heretofore been made, are now permanently employed in each of the engine-houses for the purpose of keeping the water at the boiling-point in the boilers connected with the engines. Since their introduction, cases have occurred where a stream of water directly from the engine has been the means of checking what might have been a serious fire.

This appendage — for it is immediately connected with the engine — is located in the basement of each engine-station, and is in the form of a boiler. Passing upward through the flooring to the engine-room are steam-pipes, which are connected with pipes attached to the boiler of the engine. Through these pipes there is a constant passage of water from the boiler below to the one above; and hence a pressure of steam may be maintained at all times, and to any degree desired. Automatic valves operate to close the pipes when they are disconnected on the occasion of an alarm of fire, when the engine is driven from the house. Of the utility of this arrangement no question can be raised; and it affords me pleasure to be able to speak of these auxiliaries in terms of the highest commendation.

FIRE-HYDRANTS AND RESERVOIRS.

The disposition heretofore evinced by the Water Board and the Superintendent to unite with me in the matter of furnishing a supply of water for the extinguishing of fires has been cordially exhibited during the past year. Wherever water-mains have been laid, fire-hydrants have been located upon them; and, since the last Report, thirty-two new hydrants, of the Perkins pattern, have been set.

The Superintendent has also substituted the Perkins hydrant in places where the old-fashioned surface or flush-hydrants have given out; and in two instances flush-hydrants have been discontinued without substitution. The introduction of the post-hydrant has been of incalculable benefit: for it does not require the removal of snow from it after every storm, as does the flush-hydrant; neither does it require to be packed with hay every winter, to prevent it from freezing. These hydrants are set so high above the ground as to make them easy to find at any time; and it has been a surprise to me, since I recommended their introduction in my Report of 1871, that they had not sooner been adopted.

The old sources of water-supply provided for use of the hand-engine are fast disappearing, their use of late years not having been required. Most of these old reservoirs were built many years ago, their sides and roofs being constructed of well-worn planking taken from the roadways of West-Boston and Craigie's Bridges when repairs were being made thereon. At great depth in the ground, the sides and roofs have gradually decayed; and in several instances the roofs have given way, causing the earth to cave into the reservoirs. In all such cases the reservoirs have been abandoned, and the Superintendent of Streets has caused them to be filled in. There are other reservoirs which will have to be abandoned sooner or later. While, in some cases, I think it would be judicious to preserve reservoirs in certain sections, yet I do not think it advisable to continue so uncertain a water-supply for our powerful steam fire-engines. Tightly-constructed reservoirs, with a capacity of two hundred thousand gallons each, located in Central, Harvard, Union, Harmony, and Reed

Squares, would be of great importance in case of a large fire in the vicinity of those squares.

APPROPRIATIONS, RECEIPTS, AND EXPENDITURES.

The appropriation for the Fire Department, made at the beginning of the financial year, was $77,000.00; to which an additional appropriation of $425.00 was voted by the City Council to meet the payment of contracts entered into for the procuring of a new steam fire-engine for Company No. 5, and new house-heating apparatus for the Police and Fire Department building on Fourth Street.

The expenditures for the department have amounted to $77,417.21, as the following statement will show: —

Services of Members, including Salaries of Engineers	$44,173 23
Water-Rates for Hydrants, Reservoirs, and House Supplies	6,463 00
Repairs and Materials	4,296 46
New Steam Fire-Engine No. 5	4,250 00
Fuel and Gas	3,273 06
Hay, Grain, and Straw	3,087 85
Expenses of Fire-Alarm, including Signal-Boxes, &c.	2,976 26
Horse-Hire, Horse-Shoeing, and Veterinary Services,	1,938 87
New Furniture, Bedding, &c.	1,396 36
Incidental Expenses, as per Auditor's books	1,265 43
Harnesses, and Harness and Hose Repairs	1,095 10
Hardware, Brooms, and general House and Stable Supplies	596 98
Labor, Care of Hydrants, ringing Bells, Refreshments, &c.	542 65
Heating Apparatus, Fourth Street Building	490 00
Alterations and Repairs, Ward One Building	448 92
Fines of Members	439 00
Hose Oil, Ladders, Expressage, &c.	404 42
Miscellaneous	279 62
	$77,417 21

Appropriation	$77,000 00	
Additional Appropriation . .	425 00	
		$77,425 00
Amount of Expenses		77,417 21
Balance unexpended		$7 79

There has been received from the sale of manure, old junk, &c., the sum of $113.00, which has been paid to the City Treasurer, and his receipt taken therefor.

FIRE-ALARM TELEGRAPH.

The work in this department has been an important one during the present year. The completion of the new City Building in Brattle Square required the transfer of all the battery and office machinery to the new apartments which had been fitted up for their reception. Previous, however, to the removal, the wires connected with the battery in Church Street were re-arranged to accommodate the change; and, upon the establishment of the battery in the new building, connections were at once made, the alarm only being cut off for a few hours on the day of removal. The new quarters are commodious, and are second to no other battery station in this country used for fire-alarm purposes. The battery-room measures thirty-two feet by forty feet, and contains, besides the cup-stands, all the necessary fixtures for cleaning and care of battery. Notwithstanding that the service is increasing, the present quarters will afford ample accommodations for several years. Adjoining the battery room is an apartment fourteen feet square, which is nicely furnished, and which contains the repeaters and other machinery necessary for a successful working of the telegraph. In this the department entertains a feeling of the utmost pride; and in an especial manner Mr. George J. Blaisdell, the operator, and his assistant, Mr. David J. Campbell.

All the apartments used by this branch of the service are creditable, and well worthy the inspection of the City Council and of every citizen of Cambridge; and their visits will be wel-

comed at all times. The telegraph has worked admirably during the year, and is now in most excellent condition.

By order of the City Council, three additional street signal-boxes have been purchased and located, — one at the corner of Water and North Streets, one at the corner of Third and Bent Streets, and one at the corner of Walden and Raymond Streets.

At the request of the Union Railway Company, two other boxes, Nos. 49 and 83, have been connected with the telegraph, at the expense of the company. These boxes are located on property owned by the company; and, while they are intended for personal protection, they are also as much at the public service as are all other street-boxes. The company has exhibited a desire to protect its large property interests by the purchase of fire-alarm boxes and the setting of fire-hydrants, — safeguards as much for the public benefit as for its own.

The further interests of the city require the placing of additional street signal-boxes in neighborhoods at present unprotected in this manner; and I would therefore recommend the purchase of two or three boxes the coming year.

Since my last Report, at which time mention was made of the malicious interference with the signal-boxes, no false alarm of fire has been given, — a fact which illustrates the benefit derived from the action taken by the Board of Aldermen in offering a reward for the apprehension of persons engaged in the mischief.

Firemen, and citizens residing in the immediate vicinity of Inman Square, are desirous of securing the service of a fire-alarm bell in that neighborhood; and I would therefore renew my recommendation of last year, — "the placing of a bell and striker in the tower on Engine House No. 5."

The total length of wire used for the transmission of alarms is about seventy-five miles; but this measurement does not include the connections extending between the several instruments and the main lines.

There are 58 street-boxes, 9 engine-house gongs, 9 engineers' or police gongs, 4 tappers or call-bells, 4 repeaters, 5 galvanometers, 2 switch-boards, 5 bell-strikers, 2 sounders, 325 battery cups, and all the necessary magnetic implements and machinery required for a complete performance of the work. The labor required of the men permanently employed in this

branch of the service is a most important one; for to them is confided the responsibility of keeping the system in working condition at all times. When by accident, or owing to the effects of wind or storm, a wire is broken, these men are required to seek and find the break, — whether it occurs by night or by day, in sunshine or in storm, — and to make the necessary repairs. The performance of this duty, particularly in a driving snow-storm, by day or night, is attended with great danger in climbing upon house-tops to correct the trouble. Their calling is, therefore, one of great responsibility; and their compensation should not be a stinted one. The moving of buildings through the streets occasions great inconvenience at times, and also imposes extra labor upon the operators, who are necessarily in attendance when buildings are passing under the telegraph-wires.

ADMISSIONS AND DISCHARGES.

But few changes have taken place in the several companies during the year, no persons having been admitted, and only a few discharged. The changes and discharges are as follows: Cornelius J. Donovan was transferred from Engine Company No. 5 to Engine Company No. 3; and Hugh T. Barker and Frank C. Mullett were transferred from Engine Company No. 1 to Engine Company No. 4. John Byron was discharged from Engine Company No. 1; Charles E. Snow, from Engine Company No. 2; John H. Cannon, Herbert A. Murch, and Eugene Frost, from Engine Company No. 4; and Joseph Gormley and James McChristal, from Truck Company No. 2, respectively at their own requests.

Michael Kelly, Thomas J. Dale, and John F. Dowling, were discharged from Engine Company No. 3, and John L. Sproul from Engine Company No. 4, severally for neglect of duty.

HORSES OF THE DEPARTMENT.

There are twenty-one horses permanently employed in the department; each engine station requiring the use of three, and each hook-and-ladder station the employment of two. There is also one horse connected with the Telegraph Department; and there is also one attached to Supply Hose Carriage No. 1. Dur-

ing the past year, several of the horses have been under the care of the veterinary surgeon; and when any are afflicted with sickness, or are suffering from strains or lameness, other horses have to be hired to take their places, involving an expense, which must of necessity be borne. One of the horses connected with Truck No. 2 was severely injured by coming in contact with the pikes in the ends of the ladders; but by skilful veterinary service, and the diligent care and attention of his driver, the horse recovered from his injury, and is now performing his duty. On occasions of heavy snow-storms, extra horses have to be hired to assist the permanently employed horses in the dragging of the apparatus. These extra horses are retained until such time as it would seem advisable to dispense with their services.

It will be necessary, the coming year, to make some changes in our stock of horses, as it is not deemed prudent to continue the use of a horse in the service when he begins to exhibit a slackened speed or an affected respiration.

Our horses should be superior in every way to the ordinary draught horse; for we expect of them a quick performance of labor, which, in nine cases out of ten, would break down horses employed at other work. It is not for the interest of the city to buy a cheap horse; and while I would not recommend the payment of fancy prices, yet I would pay a price which would secure the possession of animals capable of doing the work required, which, as I said before, must be done quickly.

ACCIDENTS AT FIRES.

I am pleased to say that no accidents have occurred at fires during the year which have caused permanent injury to the persons receiving them.

Mr. John D. Thompson, Relief Engineer, met with a severe injury to his left leg when stepping into the pan of Engine No. 3, on the occasion of an alarm of fire; the effect of which unfitted him from attending to his duty for several weeks.

Slight injuries, caused by falling slates, befell members of the department at the fire in "Hollis Hall," in the College Grounds, Jan. 26, and also at the fire on Bridge Street, Nov. 20.

The Chief Engineer narrowly escaped suffocation and burn-

ing at a fire in "Temple Block," Feb. 14; having fallen through a hatchway into the cellar, where the fire was located. He was rescued from his perilous position by Capt. J. S. Sawyer, insurance agent, and by firemen Sharon and Mahaffey, and substitute Bartlett of Truck Company No. 1, at great personal risk.

Assistant Engineer Casey narrowly escaped serious injuries; having fallen in the street while attempting to jump into the pan of Engine No. 3 on its way to a fire.

Assistant Engineer Tobin received a severe strain by partially falling through a hatchway at a fire on Bridge Street, June 11.

The engineer in charge of the private gas-works of the Revere Sugar Refinery Company was badly burned while attempting to extinguish a fire in the gas-house Feb. 1.

CAMBRIDGE FIREMEN'S RELIEF ASSOCIATION.

This benevolent association, wholly composed of members of the Fire Department, still continues to render relief to its members when necessity requires it. The association has a small relief fund deposited in the Cambridgeport Savings Bank, from which aid is rendered. The fund has been augmented from time to time by the donations of citizens, who have in this manner expressed their approbation of a worthy organization.

The officers of the association are as follows: —

President. — P. H. Raymond.
Vice-President. — William H. Emory.
Secretary. — Charles Emerson.
Treasurer. — William B. Cade.
Trustees. — P. H. Raymond, William B. Cade, Nathaniel W. Bunker, Charles Emerson, Charles W. Brackett, William F. Newman, Francis P. Scanlan, James M. Keaney.

ACKNOWLEDGMENTS.

I desire to express my deep sense of obligation to his Honor the Mayor for his constant and earnest support of this department. To the City Council my sincerest thanks are due for

their ready co-operation, without which, indeed, I could not have accomplished what the work of the year now shows. The several heads of departments, and other officials connected with the government, are likewise entitled to an expression of my thanks for courtesies shown me at all times.

To the Board of Engineers, and the officers and members of the force, I herewith extend my heartfelt thanks for their valued services at fires, and for their good conduct, and faithfulness in the performance of their several duties.

For favors and attentions at the hands of the Boston Board of Fire Commisioners, and Chief Engineer Green of the Boston Fire Department, I am deeply indebted.

Chief of Police George H. Copeland and his efficient force will please accept my thanks for the valuable services rendered at fires, by which property was protected, and good order maintained.

Chief Engineer Hopkins of the Somerville Fire Department will also consider me indebted to him and his department for services rendered at fires in this city.

All others who have lent a helping hand, or have in any way co-operated with me, are also entitled to my sincerest thanks.

Respectfully submitted.

PATRICK H. RAYMOND,
Chief Engineer Cambridge Fire Department.

APPENDIX.

Joint Standing Committee on Fire Department.

ALDERMEN . . . . . Howard and Greely.
COUNCILMEN . . . . . Doyle, Poland, and Whiting.

Board of Engineers.

Name.	Rank.	Age.	Occupation.	Residence.	Salary per ann.
Patrick H. Raymond,	Chief.	46	Reporter	10 Pleasant St. .	$1,200.00
Thomas J. Casey . .	1st Assistant .	43	Carver	173 Cambridge St.	400.00
Richard F. Tobin . .	2d Assistant .	32	Iron Moulder .	5 Winsor St. . .	400.00
Daniel O'Connell . .	3d Assistant .	39	Clerk	219 North Ave. .	400.00
John P. Farmer, jr.	4th Assistant .	34	Coll'ge Purveyor	29 Mellen St. . .	400.00
John P. Farmer, jr.	Secretary. . .				50.00

Cambridge Steam Fire-Engine Company, No. 1.

House corner of Mt. Auburn and Eliot Streets.

Name.	Rank.	Age.	No. of Badge.	Occupation.	Monthly Pay.
Edward E. Priest . .	Engineer,	39	3	Engineer	$100.00
Hiram W. Hooker . .	Driver,	38	5	Driver	85.00
Robert T. Hixon . .	Driver,	32	10	Driver	85.00
William H. Emory . .	Foreman,	43	1	Printer.	18.33
Charles W. Brackett .	Assistant,	40	2	Bookkeeper	17.50
John L. Jones, jr. . .	Fireman,	25	4	Printer.	16.67
John K. Perkins . .	Hoseman,	27	12	Cabinet Maker . . .	16.67
Thomas W. Jones . .	"	27	8	Electrotype Finisher .	16.67
John H. Brown . . .	"	25	11	Cigar Maker	16.67
Edward E. Keyes . .	"	25	7	Bookbinder	16.67
John E. Belcher . . .	"	23	6	Clerk	16.67
Edward B. O'Brien .	"	25	9	Upholsterer	16.67

The engine in charge of the above company was built by the Amoskeag Manufacturing Company, Manchester, N.H., and is rated as second class. It is supplied with one steam cylinder 8½ inches in diameter; one double-acting, vertical plunger pump

4¾ inches in diameter, with 12-inch stroke. The engine is supplied with two copper tanks, which contain a supply of fresh water, to be used when draughting sea-water. The engine, when worked to its full capacity, will discharge 400 gallons per minute. Put in service Sept. 18, 1864.

Union Steam Fire-Engine Company, No. 2.

House on Main Street, near Winsor.

Name.	Rank.	Age.	No. of Badge.	Occupation.	Monthly Pay.
Thomas Wiseman . .	Engineer,	32	17	Engineer	$100.00
John H. Walker . .	Driver,	47	19	Driver	85.00
William H. Foss. . .	Driver,	36	27	Driver	85.00
William B. Cade . .	Foreman,	42	15	Polisher	18.33
Daniel McCarty . .	Assistant,	40	21	Blacksmith	17.50
Amos B. Jarvis . . .	Fireman,	32	24	Bookbinder	16.67
Arthur C. Day . . .	Hoseman,	39	25	Box Maker	16.67
James Cunningham .	"	34	28	Wood Turner . . .	16.67
Benjamin D. Foss . .	"	40	18	Carpenter.	16.67
Charles E. Conner. .	"	25	23	Machinist.	16.67
Joseph Fellows . . .	"	25	22	Clerk	16.67
Albert F. Sawyer . .	"	33	20	Painter	16.67
Edward Brady . . .	"	30	16	Iron Moulder . . .	16.67

The engine in charge of this company was contracted for in August, 1873, and put in service Nov. 28, 1873. The engine is of second-class construction, and was built by the Amoskeag Manufacturing Company, Manchester, N.H., where the several engines in the department were constructed.

The boiler contains 301 brass tubes, each tube being 18 inches long and 1¼ inches in diameter. The main forcing-pump, double-acting and made of brass, measures 4¼ inches in diameter, and has a stroke of 8 inches. The steam cylinders have a diameter of 6⅞ inches, and an 8-inch stroke.

The weight of engine, with fuel and water, is 6,250 pounds.

Niagara Steam Fire-Engine Company, No. 3.

House on Fourth Street, near Cambridge.

Name.	Rank.	Age.	No. of Badge.	Occupation.	Monthly Pay.
Hiram Blood	Engineer,	44	31	Engineer	$100.00
James S. Casey . . .	Driver,	40	33	Driver	85 00
Lorenzo H. Dale . .	Driver,	34	34	Driver	85.00
William Parker . . .	Foreman,	36	29	Carver	18.33
Michael G. Collins . .	Assistant,	32	36	Painter	17.50
Elliott E. Alley . . .	Fireman,	40	30	Upholsterer	16.67
William F. Newman .	Hoseman,	30	38	Wood Worker . . .	16.67
Edwin Winward . .	"	30	39	Box Maker	16.67
George F. Batchelder .	"	26	42	Machinist	16.67
Alexander S. Atkins .	"	31	35	Saloon Keeper . . .	16.67
Cornelius J. Donovan .	"	32	32	Wood Turner . . .	16.67
John Casey	"	26	41	Britannia Worker . .	16.67

The engine in charge of this company was contracted for in 1871, and put in service Jan. 19, 1872, and is a fine and very powerful specimen of steam-machinery used for the extinguishment of fires. Like all other steamers owned by the city, it was built by the Amoskeag Manufacturing Company of Manchester, N.H. The engine is of first-class construction, and has a boiler 32 inches in diameter and 66 inches long, containing 301 brass tubes, each tube being 18 inches long and 1¼ inches in diameter.

The main forcing-pump is 4⅜ inches in diameter, and has a stroke of 8 inches in length. The steam cylinders measure 7¾ inches in diameter, with a stroke of piston of 8 inches.

Daniel Webster Steam Fire-Engine Company, No. 4.

House on North Avenue, near Russell Street.

Name.	Rank.	Age.	No. of Badge.	Occupation.	Monthly Pay.
John E. Ricker	Engineer,	32	45	Engineer	$100.00
George T. Presby	Driver,	34	47	Driver	85.00
George E. Muzzey	Driver,	34	48	Driver	85.00
Benjamin Young	Foreman,	32	49	Carpenter	18.33
Nathaniel W. Bunker	Assistant,	33	55	Carpenter	17.50
Sylvanus G. Griffin	Fireman,	29	46	Machinist	16.67
George E. Gilkey	Hoseman,	29	43	Clerk	16.67
William H. Harrison	"	28	50	Bill Poster	16.67
Edwin H. Locke	"	30	53	Provision Dealer	16.67
Thomas J. Benwell	"	25	56	Clerk	16.67
Frank C. Mullett	"	23	51	Confectioner	16.67
Hugh T. Barker	"	26	54	Confectioner	16.67

The engine in charge of this company is of the double pump, second class, small size pattern, with $4\frac{1}{8}$-inch pump cylinders, and 8-inch stroke, steam cylinders $6\frac{7}{8}$-inch diameter, and 8-inch stroke; and, without fuel or water, in weight 5,800 pounds. It was built by the Amoskeag Manufacturing Company of Manchester, N.H., and put in service May 28, 1869.

P. H. Raymond Steam Fire-Engine Company, No. 5.

House in Inman Square, corner Hampshire Street.

Name.	Rank.	Age.	No. of Badge.	Occupation.	Monthly Pay.
Charles E. Berry	Engineer,	29	102	Engineer	$100.00
Joseph P. Cartwright	Driver,	40	104	Driver	85.00
Francis P. Carr	Driver,	32	105	Driver	85.00
Francis P. Scanlan	Foreman,	30	100	Painter	18.33
Conrad D. Kinnear	Assistant,	37	107	Clerk	17.50
Charles W. Porter	Fireman,	28	103	Clerk	16.67
Dana R. Hovey	Hoseman,	37	106	Clerk	16.67
John D. DeRonde	"	37	108	Cabinet Maker	16.67
James Glynn	"	25	109	Iron Moulder	16.67
George W. Butler	"	23	110	Engineer	16.67
John Fitzgerald	"	37	111	Iron Moulder	16.67
Thomas E. Banfield	"	29	112	Mason	16.67
Charles H. Barker	"	34	113	Confectioner	16.67

The engine in charge of this company is of the same style of construction as No. 2, and was also built by the Amoskeag Manufacturing Company at the close of the present year. It was delivered Nov. 18; and, after a thorough test of its capabilities, it was put in service in place of the engine previously operated by the company.

The hose-carriage in charge of this company is of the old two-wheel pattern, and should be dispensed with altogether for active service. The carriage is so constructed as to impose a large share of the load upon the back of the horse, who cannot, when responding to an alarm, keep up with the engine. This style of carriage is unsuitable; and I would recommend the purchase of a four-wheeled carriage.

Franklin Hook and Ladder Company, No. 1.

House in City Building, corner Western Avenue and Green Street.

Name.	Rank.	Age.	No. of Badge.	Occupation.	Monthly Pay.
George W. Lamson	Driver,	35	59	Driver	$85.00
James P. Ewell	Foreman,	40	62	Pianoforte-Key Maker,	18.33
Charles Emerson	Assistant,	31	69	Confectioner	17.50
Charles S. Abbott	Ladder man,	36	65	Ivory Layer	16.67
Charles H. Wiggin, jr.	"	28	70	Furniture Polisher	16.67
Hamilton Porter	"	33	63	Blacksmith	16.67
Albert S. Benson	"	32	72	Box Maker	16.67
Charles H. Waite	"	30	73	Clerk	16.67
George R. Oliver	"	25	57	Polisher	16.67
John T. Mahaffey	"	31	67	Carpenter	16.67
William Parks	"	32	77	Iron Moulder	16.67
Daniel E. Owen	"	32	60	Carpenter	16.67
William H. Lydston	"	29	68	Carpenter	16.67
Clarence A. Moore	"	26	58	Confectioner	16.67
Charles A. Sharon	"	27	64	Machinist	16.67
John H. Jacobs	"	26	76	Provision Dealer	16.67
Joseph B. Farmer	"	38	74	Steam and Gas Fitter,	16.67
Warren H. Dow	"	26	71	Box Maker	16.67
James A. Bushee	"	31	75	Furniture Polisher	16.67
Charles E. Warren	"	32	66	Teamster	16.67
Elisha W. Morey	"	29	61	Furniture Polisher	16.67

Mayor Bradford Hook and Ladder Company, No. 2.

House on Cambridge Street, corner of Portland.

Name.	Rank.	Age.	No. of Badge.	Occupation.	Monthly Pay.
Jeremiah R. Hobbs .	Driver,	29	81	Driver	$85.00
James Dalton . . .	Foreman,	39	79	Butcher	18.33
James J. Fleming . .	Assistant,	36	80	Iron Moulder . . .	17.50
Walter R. Marsh . .	Ladder man,	39	83	Oil-Clothes Maker . .	16.67
Jacob F. Bradeen . .	"	43	84	Mason	16.67
John S. Dooris . . .	"	30	85	Blacksmith	16.67
Richard T. Marvin . .	"	41	89	Carpenter	16.67
Philip C. Munroe . .	"	35	91	Saloon Keeper . . .	16.67
Thomas L. Hunter . .	"	36	93	Iron Moulder	16.67
James M. Keaney . .	"	25	94	Pork Packer	16.67
Michael Cairns . . .	"	39	95	Carpenter	16.67
John Lennon . . .	"	28	96	Glass Blower . . .	16.67
Timothy Mahoney . .	"	28	97	Cabinet Maker . . .	16.67
William J. Stinson . .	"	28	98	Core Maker	16.67
Alford F. Chadwick .	"	41	99	Carpenter	16.67
Orville W. Van Duzee,	"	30	82	Iron Moulder . . .	16.67
John McCarty . . .	"	26	90	Iron Moulder . . .	16.67
Peter McNally . . .	"	37	86	Mason	16.67
Timothy J. McHugh .	"	27	87	Brass Finisher . . .	16.67

Both hook and ladder trucks are drawn to fires by horses, and each truck is furnished with proper appurtenances.

Supply Hose-Carriage, No. 1.

House in City Building, corner of Green Street and Western Avenue.

Name.	Rank.	Age.	No. of Badge.	Occupation.	Monthly Pay.
Lewis C. Clark . . .	Driver,	31	78	Driver	$85.00

This carriage has no company attached to it; the apparatus being, as its name implies, a supply-carriage for the furnishing of extra hose to the steamers at fires, should it be required.

The carriage is of the two-wheel pattern; and it carries a reel of 650 feet of hose, besides being fully equipped with hydrant connections, pipes, spanners, wrenches, &c.

I would recommend that a four-wheeled carriage be substituted for the present clumsy and unwieldy vehicle.

Relief Engineer.

Name.	Rank.	Age.	Occupation.	Monthly Pay.
John D. Thompson .	Relief Engineer,	35	Relief Engineer . . .	$100.00

Cambridge Fire Alarm Telegraph.

Battery Station, City Building, Ward One.

Name.	Rank.	Age.	Occupation.	Monthly Pay.
George J. Blaisdell .	Telegraph Operator,	32	Telegraph Operator,	$85.00
David J. Campbell .	Assistant Operator,	29	Assistant Operator,	75.00

RECORD OF FIRES AND ALARMS FROM DECEMBER 1, 1875, TO NOVEMBER 30, 1876.

Day of Week.	Date.	Hour.	Box.	Owners of Property.	Occupants of Property.	Location of Fires.	Loss.	Insurance.	Apparatus Present.	General Remarks.
	1875.									
Wednesday.	Dec. 1.	6.12 P.M.	6	Elijah H. Luke . . .	Hayward & Kimball.	Main Street . .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Fire in furniture factory, origin not traceable.
Wednesday.	" 1.	9.15 A.M.	Bell.	Unknown	Unknown	Somerville. . .	. . . . .	. . . . .	Engine 4.	Fire in Somerville, bell alarm in Ward Five only.
Friday . . .	" 3.	8.14 P.M.	36	Charles H. Danforth.	Charles H. Danforth.	Central Square.	$200	. . . . .	Engines 1, 2, & 5. H. & L. 1 and 2, Supply Hose 1.	Fire in photographer's saloon, probably originating from chemicals.
Tuesday . .	" 14.	9.55 A.M.	78	Collins & Turner . .	Collins & Turner . .	Concord Ave. .	Trifling .	. . . . .	Engines 1, 4, & 5, H. & L. 1.	Slight fire in counting-room at brick-yard, caused by defective chimney.
Friday . . .	" 17.	6.35 P.M.	6	Jacob Baldwin, jun..	Several Families . .	Main Street . .	Trifling .	. . . . .	Engine 5.	Burning of rags in dwelling. Box 6 was struck; but the only response was from the Methodist Church bell.
Tuesday . .	" 21.	11.25 P.M.	59	James Bolger	James Bolger	Murray Street.	$150	$150	Engines 1, 2, 4, & 5, H. & L. 1, and Supply Hose 1.	Destruction of a small barn, cause of fire unknown.
Tuesday . .	" 28.	11.04 P.M.	48	Tolman Willey . . .	George W. Carr. . .	Elm Street . .	450	250	Engines 1, 2, & 5, H. & L. 1 and 2, and Supply Hose 1.	Fire in barn used for horse-keeping and for the storage of old rags, in which the fire probably originated from spontaneous combustion.
Wednesday.	" 29.	1.45 P.M.	26	Dimick & Russell . .	Jaynes & Co.	Pacific Street .	24,000	15,000	Engines 1, 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Burning of the barrel factory of Jaynes & Co., which, owing to a scarcity of water, was wholly destroyed.
Wednesday.	" 29.	1.50 P.M.	25	" " . .	"	" "	8,000	5,000		
Wednesday.	" 29.	5.12 P.M.	13	Unknown	Unknown	Winter Street.	Trifling .	. . . . .	Engine 3.	Explosion of kerosene-lamp.
	1876.									
Tuesday . .	Jan. 4.	10.51 A.M.	26	Allen & Endicott . .	Jaynes & Co.	Main Street . .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Burning of shingles on roof of barrel factory, caused by sparks from chimney.
Friday . . .	" 7.	1.00 A.M.	Bell.	Unknown	Unknown	Somerville. . .	. . . . .	. . . . .	Engine 4.	Fire in Somerville, bell-alarm in Ward Five only.
Sunday. . .	" 9.	9.03 P.M.	17	Boston and Albany Railroad	Boston and Albany Railroad	Main Street . .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Burning of cotton-waste in store-shed.
Monday . .	" 10.	6.47 P.M.	32	Unknown	Unknown	Columbia St. .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Alarm needlessly given, escape of steam from boiler being the cause.

Wednesday.	Jan. 12.	6.48 P.M.	42	Unknown	Unknown	Brighton Dist..	. . . . .	. . . . .	Engines 1, 2, & 5, H. & L. 1, and Supply Hose 1.	Burning of rope-walk in the Brighton District. Assistance sent from this city.
Friday . . .	" 14.	5.30 P.M.	6	Rawson & Hittinger.	Rawson & Hittinger.	Main Street . .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Slight fire in machine-shop, probable ignition of oily waste.
Friday . . .	" 14.	6.55 P.M.	6	" "	" " . .	"	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Rekindling of former fire.
Monday . .	" 17.	2.39 P.M.	72	John W. Wood . . .	John W. Wood . . .	Norris Street .	Trifling .	. . . . .	Engines 1, 4, & 5, H. & L. 1, and Hose 4 of Somerville.	Burning of hay in cellar; set on fire by children playing with matches.
Thursday. .	" 20.	10.03 P.M.	46	John Connors. . . .	John Connors	Green Street .	Trifling .	. . . . .	Engines 1, 2, & 5, H & L. 1, and Supply Hose 1.	The upsetting of a stove in a grocery set the wood-work on fire.
Tuesday . .	" 25.	8.35 A.M.	15	Hugh Ross	Several Families . .	Fifth Street . .	Trifling .	. . . . .	Engines 2. 3. & 5, H. & L. 2, and Supply Hose 1.	Burning of clothing in tenement-house. Alarm unnecessary.
Wednesday.	" 26.	10.55 A.M.	59	Harvard College. . .	"Hollis Hall," Dormitory.	College Grounds .	$6,000	. . . . .	Engines 1, 2, 4, & 5, H. & L. 1 and 2, and Supply Hose 1.	Fire in students' dormitory-building, the upper part of which was used for theatrical performances. The fire was doubtless caused by a falling coal from an open grate. The loss the college authorities fix at the sum named, which probably embraces the cost of changes and repairs to the building.
Friday . . .	" 28.	5.31 A.M.	69	Sarah Rooney. . . .	Several Families . .	Montgomery Street .	400	$400	Engines 1, 4, & 5, H. & L. 1, and Hose 4 of Somerville.	Cause of fire, defective chimney.
Friday . . .	" 28.	5.45 A.M.	73	" . . .	" . .	"				Alarm given from box 73 for same fire. A workman was badly burned while trying to put out the fire.
Tuesday . .	Feb. 1.	10.00 A.M.	52	Hycent Purcell . . .	Hycent Purcell . . .	Mt. Auburn St.	140	140	Engines 1, 2, & 5, H. & L. 1, and Supply Hose 1.	Burning of bedding which caught fire from overheated stove.
Tuesday . .	" 1.	11.22 A.M.	12	Revere Sugar Refinery Company . . .	Revere Sugar Refinery Company . . .	Water Street .	100	. . . . .	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Fire in gas retort. The engineer of the works was badly burned.
Wednesday.	" 2.	5.50 P.M.	14	Unknown	Unknown	Cambridge St..	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Burning of chimney in tenement-block.
Saturday . .	" 5.	7.30 A.M.	14	"	"	Eighth Street .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Burning of a bed in tenement-house.
					Amounts carried forward		$39,240	$20,940		

RECORD OF FIRES AND ALARMS FROM DECEMBER 1, 1875, TO NOVEMBER 30, 1876. — *Continued.*

Day of Week.	Date.	Hour.	Box.	Owners of Property.	Occupants of Property.	Location of Fires.	Loss.	Insurance.	Apparatus Present.	General Remarks.
	1876.				*Amounts br'ght forward*		$39,240	$20,940		
Saturday . .	Feb. 5.	8.31 P.M.	16	H. M. Bird	Samuel Vance. . .	Sixth Street. .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Hot iron placed too near woodwork in foundry set the building on fire.
Sunday. . .	" 13.	4.30 A.M.	Bell.	Unknown	Unknown	Somerville. . .	. . . . .	. . . . .	Engine 4.	Fire in Somerville, bell-alarm in Ward Five only.
Monday . .	" 14.	10.07 P.M.	36	C. K. Kirby	F. E. Marston. . . .	Main Street . .	$1,000	1,000	Engines 1, 2, & 5, H. & L. 1 and 2, and Supply Hose 1.	Fire in cellar of toy and variety store. While operating at the fire, the Chief Engineer fell through a hatchway into the cellar, and was with difficulty rescued from his perilous position.
Sunday. . .	" 20.	6.12 P.M.	46	F. G. Pope	F. G. Pope	Bay Street. . .	Trifling .	. . . . .	Engines 1, 2, & 5, H. & L. 1, and Supply Hose 1.	Smoke escaping from building led to the belief that it was on fire.
Monday . .	" 21.	4.01 A.M.	27	Jesse Talbot.	N. D. Kenison. . . .	Winsor Street.	$500	500	Engines 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Fire caused by defective chimney.
Saturday . .	Mar. 4.	8.00 A.M.	27	Joseph Newmarch. .	Joseph Newmarch. .	Harvard Street	Trifling .	. . . . .	Engines 2, 3, and 5, H. & L. 1 and 2, and Supply Hose 1.	Cause of fire, hot ashes in wooden vessel.
Saturday . .	" 4.	11.22 P.M.	9	Woodbury & Co. . .	Woodbury & Co. . .	First Street . .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Burning of shavings in boiler-room.
Sunday. . .	" 5.	7.29 P.M.	34	Patrick Doherty. . .	Patrick Doherty. . .	Elm Street . .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Explosion of kerosene-lamp.
Thursday. .	" 9.	. . . . .	Bell.	W. L. Whitney . . .	Several Families . .	Main Street . .	Trifling .	. . . . .	Engine 2.	Burning of bed in tenement.
Saturday . .	" 11.	11.12 P.M.	2	Lowell Railroad Co..	Lowell Railroad Co..	Railroad Bridge	Trifling .	. . . . .	Engines 2, 3. & 5, H. & L. 2, and Supply Hose 1.	Sparks from locomotive set bridge on fire.
Friday . . .	" 17.	12.20 A.M.	Bell.	Unknown	Unknown	Somerville. . .	. . . . .	. . . . .	Engine 4.	Fire in Somerville, bell-alarm in Ward Five only.
Sunday. . .	" 19.	10.29 A.M.	17	G. M. Rogers	Several Families. . .	Main Street . .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Fire in basement of tenement-block.
Sunday. . .	" 19.	1.07 P.M.	17	Unknown	Several Families. . .	Hastings Street	$150	150	Engines 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Cause of fire unknown.

Tuesday . .	Mar. 21.	7.22 P.M.	8	Middlesex County.	House of Correction.	Thorndike St. .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Overheated furnace-pipe set woodwork on fire.
Thursday. .	" 30.	11.40 P.M.	Bell.	Unknown	Unknown	Somerville. . .	. . . . .	. . . . .	Engine 4.	Fire in Somerville, bell-alarm in Ward Five only.
Saturday . .	Apr. 1.	10.44 P.M	35	E. C. Stevens	E. C. Stevens	Broadway. . .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Slight fire in hennery, probably set by some malicious person.
Thursday . .	" 6.	3.19 P.M.	72	C. H. Tyler	Samuel Baxendale .	Montgomery St.	$3,000	$3,000	Engines 1, 2, 4, & 5, H. & L. 1, Supply Hose 1, and Hose 4 of Somerville.	Fire originated in shoddy mill from sparks from wool-picker.
Thursday . .	" 6.	3.20 P.M.	71	"	"	" "	. . . . .	. . . . .		Alarm given from Box 71 for same fire.
Sunday. . .	" 9.	12.03 P.M.	59	Harvard College. . .	Students' Dormitory.	Harvard Street	. . . . .	. . . . .	Engines 1, 2, 4, & 5, H. & L 1, and Supply Hose 1.	Burning out of chimney in "Holyoke House."
Tuesday . .	" 18.	4.45 A.M.	43	George Baneroft. . .	Calef & Co.	Sands Street. .	Trifling .	. . . . .	Engines 1, 2, & 5. H. & L. 1, and Supply Hose 1.	Fire in planing-mill, probably of incendiary origin.
Wednesday.	" 19.	1.33 A.M.	73	Timothy Brosnahan.	Timothy Brosnahan.	Jackson Street.	$350	350	Engines 1, 4, & 5, H. & L. 1, and Hose 4 of Somerville.	Burning of small stable, and slight damage to dwelling-house.
Friday . . .	" 28.	8.22 A.M.	54	Henry Greenough. .	Henry Greenough. .	Cambridge St..	Trifling .	. . . . .	Engines 1, 4, & 5, H. & L. 1, and Supply Hose 1.	Burning of rags in ash-bin.
Sunday. . .	" 30.	3.05 A.M.	8	Mary I. Byron . . .	Unoccupied	Vine Street . .	$2,500	2,500	Engines 2, 3, & 5, H. & L 2, and Supply Hose 1.	Unoccupied dwelling-houses set on fire by William Byron, to secure the insurance. He was convicted of the offence, and imprisoned for a term of two years.
Monday . .	May 1.	5.38 P.M.	59	Jonathan Mann. . .	Boarding House. . .	Mt. Auburn St.	Trifling .	. . . . .	Engines 1, 2, 4, & 5, H. & L. 1, and Supply Hose 1.	Burning of a bed in boarding-house, set on fire by a little child.
Wednesday.	" 3.	9.48 P.M	69	A. H. Hews & Co. .	A. H. Hews & Co. .	Raymond St. .	Trifling .	. . . . .	Engines 1, 4, & 5, H. and L. 1, and Hose 4 of Somerville.	Slight fire in pottery.
Monday . .	" 15.	9.36 A.M.	15	Daniel Randall . . .	Daniel Randall . . .	Sixth Street. .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Burning of wearing apparel in closet.
Tuesday .	" 16.	12.06 A.M	73	Ulriek Kearn	Ulriek Kearn	Montgomery St.	Trifling .	. . . . .	Engines 1, 4, & 5, H. & L. 1, and Hose 4 of Somerville.	Small shed slightly burned.
Tuesday . .	" 16.	8.38 P.M	36	Charles Kimball . . .	D. C. Willis	Austin Street .	Trifling .	. . . . .	Engines 1, 2, & 5, H. & L. 1 and 2, and Supply Hose 1.	Burning of shingles on roof, a lighted cigar being thrown thereon.
					Amounts carried forward		$46,740	$28,440		

RECORD OF FIRES AND ALARMS FROM DECEMBER 1, 1875, TO NOVEMBER 30, 1876. — *Continued.*

Day of Week.	Date.	Hour.	Box.	Owners of Property.	Occupants of Property.	Location of Fires.	Loss.	Insurance.	Apparatus Present.	General Remarks.
	1876.				*Amounts br'ght forward*		$46,740	$28,440		
Saturday. .	May 20.	8.25 A.M.	28	Whittemore & Hale .	Whittemore & Hale.	Davis Street. .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Burning of shingles on roof of soap-factory.
Saturday . .	" 20.	11.00 P.M.	Bell.	Unknown	Unknown	Somerville. . .	. . . . .	. . . . .	Engine 4.	Fire in Somerville, bell-alarm in Ward Five only.
Sunday. . .	" 21.	1.33 A.M.	73	John Foley	John Foley	Spruce Street .	$700	700	Engines 1, 4, & 5, H. & L. 1, and Hose 4 of Somerville.	Fire in dwelling-house, caused by defective chimney.
Monday . .	" 22.	1.45 A.M.	Bell.	Unknown	Unknown	Arlington . . .	. . . . .	. . . . .	Engine 4.	Fire in Arlington, bell-alarm in Ward Five only.
Monday . .	" 22.	8.03 P.M.	51	Edward White . . .	Edward White . . .	Ellery Street. .	500	500	Engines 1, 2, & 5, H. & L. 1, and Supply Hose 1.	Barn struck by lightning during a heavy thunder-shower.
Saturday . .	" 27.	10.14 P.M.	43	Jacob Ramhofer. . .	Jacob Ramhofer . .	Cowperthwaite Street	Trifling .	. . . . .	Engines 1, 2, & 5, H. & L. 1, and Supply Hose 1.	Kerosene-lamp exploded in dwelling-house.
Sunday. . .	June 11.	5.00 A.M.	12	S. G. Jones	S. G. Jones	Gore Street . .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 1, and Supply Hose 1.	Fire in boiler-room of machine-shop.
Thursday. .	" 15.	3.05 P.M.	Bell.	Gardner Thwing. . .	Several Families . .	Ericsson Court	Trifling .	. . . . .	Supply Hose 1, and H. & L. 1.	Fire on roof, caused by sparks from chimney.
Friday . . .	" 23.	9.29 P.M.	73	John Foley	Unoccupied	Spruce Street .	Trifling .	. . . . .	Engines 1, 4, & 5, H. & L. 1, and Hose 4 of Somerville.	Partially burnt building set on fire.
Saturday . .	" 24.	9.20 A.M.	38	William Warnock. .	Several Families . .	Pearl Street. .	Trifling .	. . . . .	Engines 1, 2, & 5, H. & L. 1, and Supply Hose 1.	Slight fire, caused by defective flue.
Wednesday.	" 28.	10.05 P.M.	69	Charles Moore . . .	William B. Draper .	North Avenue.	$3,500	1,000	Engines 1, 2, 4, & 5, H. & L. 1, Supply Hose 1, and Hose 4 of Somerville.	Explosion of kerosene-lamp in book and furnishing store.
Wednesday.	" 28.	10.15 P.M.	69	" "	Several Families . .	" "	1,000	835		
Wednesday.	" 28.	2.00 A.M.	Bell.	Unknown.	Unknown	Somerville . .	. . . . .	. . . . .	Engine 4.	Fire in Somerville, bell-alarm in Ward Five only.
Friday . . .	" 30.	12.37 P.M.	43	Mrs. Crosby.	Mrs. Crosby.	Flagg-St. Court	Trifling .	. . . . .	Engines 1, 2, & 5, H. & L. 1, and Supply Hose 1.	Fire in cellar of house, caused by children playing with matches.
Saturday . .	July 1.	9.35 P.M.	42	Unknown	Unknown	Brighton Dist..	. . . . .	. . . . .	Engines 1, 2, & 5, H. & L. 1, and Supply Hose 1.	Burning of a pottery-building in the Brighton District, near the Cambridge line. Assistance was sent from this city.

Tuesday . .	July 4.	11.35 P.M.	78	Collins & Turner . .	Collins & Turner . .	Concord Ave. .	$300	. . . . .	Engines 1, 4, & 5, H. & L. 1.	Fire in cord-wood in brick-yard. Maliciously set on fire.
Saturday . .	" 8.		Still.	H. B. James	H. B. James	Quincy Street .	Trifling .	. . . . .	Engine 1.	Slight fire in dwelling-house.
Saturday . .	" 8.	11.59 P.M.	78	Collins & Turner . .	Collins & Turner . .	Concord Ave. .	$100	. . . . .	Engines 1, 4, & 5, H. & L. 1.	Fire in cord-wood. Maliciously set on fire.
Saturday . .	" 15.	5.38 P.M.	17	Josselyn Heirs . . .	Several Families . .	Washington St.	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 1 & 2, and Supply Hose 1.	Smoke from stove-pipe in dwelling.
Monday . .	" 24.	8.40 A.M.	14	J. Devine	Several Families . .	Carson Street .	$250	$250	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Defect in chimney.
Wednesday.	" 26.	12.34 A.M.	15	David Liebert. . . .	David Liebert. . . .	Vine Street . .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Capsizing of kettle of fat in bakery.
Friday . . .	" 28.	9.23 P.M.	14	Unknown	Unknown	Somerville. . .	. . . . .	. . . . .	Engines 2, 3. & 5, H. & L. 2, and Supply Hose 1.	Fire in Somerville, near Cambridge line.
Wednesday.	Aug. 2.	6.04 P.M.	59	Samuel Batchelder .	Randolph Caldwell .	Brattle Street .	$300	300	Engines 1, 2, 4, & 5, H. & L. 1, and Supply Hose 1.	Partial burning of a small stable.
Friday . . .	" 4.	6.00 A.M.	72	Daniel McConnell. .	Several Families . .	Cedar Street. .	Trifling .	. . . . .	Engines 1, 4, & 5, H. & L. 1, and Hose 4 of Somerville.	Smoky chimney cause of alarm.
Monday . .	" 7.	12.41 A.M.	32	Daniel Wholly . . .	Daniel Wholly . . .	Elm Street . .	$400	. . . . .	Engines 2, 3, & 5, H. & L. 2, Supply Hose 1, and portions of Somerville dep't.	Small building used for the storage of rags wholly destroyed, and the owner's horse burned.
Monday . .	" 7.	11.50 P.M.	72	Martin Toye	Unoccupied	Spruce Street .	300	300	Engines 1, 4, & 5, H. & L. 1, and Hose 4 of Somerville.	Unoccupied dwelling set on fire.
Wednesday.	" 9.	9.29 P.M.	24	Alexander Adams. .	Grocery Store. . . .	Lopez Street .	450	450	Engines 1, 2, & 5, H. & L. 1, and Supply Hose 1.	Explosion of kerosene lamp.
Sunday. . .	" 20.	1.28 P.M.	78	John McGuire . . .	John McGuire . . .	New Street . .	400	400	Engines 1, 4, & 5, H. & L. 1.	Sparks from locomotive set roof of dwelling-house on fire.
Friday . . .	" 25.	2.49 P.M.	69	Unknown	Unknown	Somerville. . .	. . . . .	. . . . .	Engines 1, 4, & 5, H. & L. 1.	Burning of barn near the Cambridge line. Assistance rendered.
Saturday . .	" 26.	9.51 A.M.	35	Alvin Davenport . .	Robt. Jones & Others	Harvard Street	1,000	1,000	Engines 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Defective chimney in dwelling.
Thursday. .	" 31.	6.50 A.M.	46	Michael Lynch . . .	Michael Lynch . . .	Franklin Street	300	300	Engines 1, 2, & 5, H. & L. 1, and Supply Hose 1.	Cause of fire in dwelling unknown.
Thursday. .	" 31.	8.18 A.M.	41	John McClure. . . .	Samuel P. Clark . .	Warland Street	Trifling .	. . . . .	Engines 1, 2, & 5, H. & L. 1, and Supply Hose 1.	Burning of a lounge, set on fire by smoker's pipe.
Saturday . .	Sept. 2.	1.04 P.M.	31	Patrick Rafferty. . .	Patrick Rafferty. . .	Cambridge St..	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Burning of shavings in wood-shed.
					Amounts carried forward		$56,240	$34,475		

RECORD OF FIRES AND ALARMS FROM DECEMBER 1, 1875, TO NOVEMBER 30, 1876. — *Continued.*

Day of Week.	Date.	Hour.	Box.	Owners of Property.	Occupants of Property.	Location of Fires.	Loss.	Insurance.	Apparatus Present.	General Remarks.
	1876.				*Amounts br'ght forward*		$56,240	$34,475		
Sunday. . .	Sept. 10	12.33 A.M.	48	Unknown	Tenement House . .	Hampshire St..	Trifling .	. . . . .	Engines 1, 2, & 5, H. & L. 1 and 2, and Supply Hose 1.	Explosion of kerosene-lamp.
Sunday. . .	" 10.	12.54 A.M.	9	C. W. Munroe. . . .	C. W. Munroe. . . .	Thorndike St. .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Burning of shavings in boiler-room.
Tuesday . .	" 12.	12.58 A.M.	9	Woodbury & Co. . .	Woodbury & Co. . .	First Street . .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Burning of shavings in boiler-room.
Friday . . .	" 29.	5.09 P.M.	92	J. H. Swiney	Several Families . .	Gore Street . .	Trifling .	. . . . .	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Burning of bed-filling in room; set on fire by children.
Thursday. .	Oct. 19.	4.55 A.M.	27	Robert Barber . . .	Robert Barber. . . .	Harvard Street	$2,020	2,020	Engines 1, 2, 3, & 5, H. & L. 1 and 2, and Supply Hose 1.	Fire in dwelling, probably caused by spontaneous combustion in painters' oily rags.
Thursday. .	" 19.	5.00 A.M.	27	"	J. W. Appleton . . .	"	300	. . . . .		
Sunday. . .	" 22.	12.02 A.M.	14	George Stevens . . .	George Stevens . . .	Fifth Street . .	2,793	2,793	Engines 2, 3, & 5, H. & L. 2, and Supply Hose 1.	Fire in organ-works. Probably incendiary.
Tuesday . .	Nov. 7.	12.54 P.M.	74	Daniel Callahan . . .	Robert Welch. . . .	Dublin Street .	Trifling .	. . . . .	Engines 1, 4, & 5, H. & L. 1, and Hose 4 of Somerville.	Burning of clothing in closet.
Thursday. .	" 9.	11.47 P.M.	68	S. S. Sleeper	S. S. Sleeper	North Avenue .	$1,500	565	Engines 1, 4, & 5, H. & L. 1.	Overheated furnace set wood-work on fire. Several members of the household were barely saved from suffocation.
Friday . . .	" 10.	12.06 P.M.	37	Joseph Rohde. . . .	Alexander Fraser. .	Pleasant Street	Trifling .	. . . . .	Engines 1, 2, & 5, H. & L. 1, and Supply Hose 1.	Little child set bedding on fire.
Wednesday.	" 15.	6.43 P.M.	65	James Semple. . . .	James Semple. . . .	Sacramento St.	$25	25	Engines 1, 4, & 5, and H. & L. 1.	Bedding set on fire by careless handling of lamp.
Monday . .	" 20.	5.10 P.M.	9	William Boynton . .	John Clark	Bridge Street .	14,000	11,000	Engines 1, 2, 3, 4, & 5, H. & L. 1 and 2, Supply Hose 1, and portions of Somerville Fire Department.	Fire in furniture-factory, having an unknown origin. Assistance was rendered by a portion of the Somerville Fire Department, and aid was tendered from Boston, which was declined on account of a scarcity of water.
Monday . .	" 20.	5.20 P.M.	9	W. H. Hartwell. . .	Page & Gove	"	. . . . .	. . . . .		
Monday . .	" 20.	5 30 P.M.	9	Braman, Shaw, & Co.	W. H. Hartwell. . .	"	1,030	1,030		
					Braman, Shaw, & Co.	"	7,300	7,300		
Thursday. .	" 23.	8.14 P.M.	54	Theodore A. Dodge .	Theodore A. Dodge .	Cambridge St. .	500	. . . . .	Engines 1, 4, & 5, H. & L. 1, and Supply Hose 1.	Fire in small stable, probably of malicious origin.
Friday . . .	" 24.	1.03 A.M.	43	Richard Conway . .	Richard Conway. . .	Grant Street .	150	. . . . .	Engines 1, 2, & 5, H. & L. 1, and Supply Hose 1.	Fire in tool-shed, supposed to have been maliciously set.
							$85,858	$59,208		

CAMBRIDGE FIRE-ALARM TELEGRAPH.

Location of Signal-Boxes.

No.	
2.	Bridge Street, corner of Prison Point.
6.	Third Street, corner of Broadway.
7.	Third Street, corner of Bent.
8.	Third Street, corner of Thorndike.
9.	Cambridge Street, Beal & Hooper's Building.
12.	Winter Street, corner of Third.
12.	North Street, corner of Water (duplicate).
13.	Fourth Street, No. 3 Engine House.
14.	Sixth Street, corner of Cambridge.
15.	Vine Street, corner of Fifth.
16.	Broadway, Hancock and Greely's Building.
17.	Washington Street, corner of Brewery.
21.	Sidney Street, corner of Allston.
23.	Pearl Street, corner of Auburn.
24.	Brookline Street, corner of Valentine.
25.	Main and Front Streets (junction).
26.	Main Street, corner of Osborn.
27.	Clark Street, corner of Harvard.
28.	Broadway, opposite Page's Box Factory.
31.	Cambridge Street, corner of Harding.
32.	Cambridge Street, corner of Columbia.
34.	Columbia Street, corner of Hampshire.
35.	Harvard Street, corner of Norfolk.
36.	Main Street, corner of Western Avenue.
37.	Pleasant and River Streets (junction).
38.	Magazine Street, corner of Lake.
39.	Magazine Street, corner of Chestnut.
41.	Pleasant Street, corner of Fairmont.
42.	Blackstone Street, opposite Riverside Press.
43.	Banks Street, corner of Flagg.
45.	Franklin Street, near Soden.
46.	Main Street, corner of Hancock.
47.	Broadway, corner of Antrim.
48.	Cambridge Street, corner of Hampshire (junction).
49.	Cambridge Street, corner of Baldwin.
51.	Broadway, corner of Ellery.
52.	Mt. Auburn and Main Streets (junction).
53.	Mt. Auburn Street, corner of Linden.
54.	Cambridge Street, corner of Sumner.
57.	Oxford Street, corner of Mellen.
59.	Harvard Square, Ramsay's Building.
62.	Mt. Auburn Street, corner of Hilliard.
63.	Brattle Street, corner of Mason, (junction).
64.	Garden Street, corner of Chauncy.
65.	North Avenue, corner of Shepard.
68.	North Avenue, near Railroad Bridge.
69.	North Avenue, No. 4 Engine House.
71.	North Avenue, near Tannery.
72.	Cedar Street, Hotel Building.
73.	Spruce Street, near Bay State Brick Yard.
74.	Dublin Street, corner of Railroad.
75.	Walden Street, corner of Raymond.
78.	Concord Avenue, corner of Sparks.
79.	Brattle Street, corner of Sparks.
82.	Brattle Street, corner of Elmwood Avenue.
83.	Mt. Auburn Street, near Belmont line.
91.	North Avenue, Union Railway car-house.
92.	Gore Street, J. P. Squire's Building.

Location of Bell-Strikers.

Unitarian Church, Harvard Square	Ward One.
Methodist Church, Harvard Street	Ward Two
Putnam Schoolhouse, Fourth Street	Ward Three.
Webster Schoolhouse, Upton Street	Ward Four.
Baptist Church, North Avenue	Ward Five.

Instruction to Key-Holders.

Alarms are to be given from the box nearest the location of the fire.

To give an alarm, open the door, pull the hook to the bottom of the slot once, and let go.

Each box contains a small bell, which, if heard before you pull, indicates that the alarm has been previously given. Any person listening at a box will learn the number of the box from which the alarm was given. For instance: if an alarm proceeds from Box 36, the bells and gongs attached will strike three, then, after a short pause, six consecutive blows; thus, III — IIIIII.

Don't give an alarm for a fire seen at a distance, unless assistance is called for.

Citizens are earnestly requested to inform themselves where keys to the signal-boxes are kept: signs suitably inscribed are placed over each box, giving the requisite information.

Instruction to Firemen, &c.

Companies not required to respond to first or second alarms will be notified by two strokes on the gongs that the fire is extinguished, that their services WILL NOT be needed, and that orders have been given to "make up." Should an alarm be given from any box while a portion of the department is engaged at a fire, the engine or ladder company located nearest to such box will immediately answer such alarm. Engine companies answering third alarms will also respond in the same manner as is described in the preceding sentence.

Police officers and citizens who may give an alarm of fire are requested to remain at the signal-box until the arrival of an engine or ladder company, and then direct them to the locality of the fire.

OPERATIONS OF THE DEPARTMENT.

THE several companies connected with the Fire Department will respond on the occasion of alarms of fire in the following order: —

Cambridge Engine Company, No. 1.

FIRST ALARM. — Boxes Nos. 21, 23, 24, 25, 36, 37, 38, 39, 41, 42, 43, 45, 46, 47, 48, 49, 51, 52, 53, 54, 57, 59, 62, 63, 64, 65, 68, 69, 71, 72, 73, 74, 75, 78, 79, 82, 83, 91.

SECOND ALARM. — Boxes Nos. 2, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 26, 27, 28, 31, 32, 34, 35, 92.

Union Engine Company, No. 2.

FIRST ALARM. — Boxes Nos. 2, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 21, 23, 24, 25, 26, 27, 28, 31, 32, 34, 35, 36, 37, 38, 39, 41, 42, 43, 45, 46, 47, 48, 49, 51, 52, 53, 59, 92.

SECOND ALARM. — Boxes Nos. 54, 57, 62, 63, 64, 65, 68, 69, 71, 72, 73, 74, 75, 78, 79, 82, 83, 91.

Niagara Engine Company, No. 3.

FIRST ALARM. — Boxes Nos. 2, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 26, 27, 28, 31, 32, 34, 35, 92.

SECOND ALARM. — Boxes Nos. 25, 36, 37, 45, 47, 48, 49.

THIRD ALARM. — Boxes Nos. 21, 23, 24, 38, 39, 41, 42, 43, 46, 51, 52, 53, 54, 57, 59, 62, 63, 64, 65, 68, 69, 71, 72, 73, 74, 75, 78, 79, 82, 83, 91.

Daniel Webster Engine Company, No. 4.

FIRST ALARM. — Boxes Nos. 54, 57, 59, 62, 63, 64, 65, 68, 69, 71, 72, 73, 74, 75, 78, 79, 82, 83, 91.

SECOND ALARM. — Boxes Nos. 43, 46, 47, 48, 49, 51, 52, 53.

THIRD ALARM. — Boxes Nos. 2, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 21, 23, 24, 25, 26, 27, 28, 31, 32, 34, 35, 36, 37, 38, 39, 41, 42, 45, 92.

P. H. Raymond Engine Company, No. 5.

FIRST ALARM. — Boxes Nos. 2, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 21, 23, 24, 25, 26, 27, 28, 31, 32, 34, 35, 36, 37, 38, 39, 41, 42, 43, 45, 46, 47, 48, 49, 51, 52, 53, 54, 57, 59, 62, 63, 64, 65, 68, 69, 71, 72, 73, 74, 75, 78, 79, 82, 83, 91, 92.

Franklin Hook-and-Ladder Company, No. 1.

FIRST ALARM. — Boxes Nos. 6, 16, 17, 21, 23, 24, 25, 26, 27, 28, 35, 36, 37, 38, 39, 41, 42, 43, 45, 46, 47, 48, 49, 51, 52, 53, 54, 57, 59, 62, 63, 64, 65, 68, 69, 71, 72, 73, 74, 75, 78, 79, 82, 83, 91.

SECOND ALARM. — Boxes Nos. 2, 7, 8, 9, 12, 13, 14, 15, 31, 32, 34, 92.

Mayor Bradford Hook-and-Ladder Company, No. 2.

FIRST ALARM. — Boxes Nos. 2, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 26, 27, 28, 31, 32, 34, 35, 36, 47, 48, 92.

SECOND ALARM. — Boxes Nos. 21, 23, 24, 25, 37, 38, 39, 41, 42, 43, 45, 46, 49, 51, 52, 53, 54, 57, 59, 62, 63, 64, 65, 68, 69, 71, 72, 73, 74, 75, 78, 79, 82, 83, 91.

Supply Hose Carriage, No. 1.

FIRST ALARM. — Boxes Nos. 2, 6, 7, 8, 9, 12, 13, 14, 15, 16, 17, 21, 23, 24, 25, 26, 27, 28, 31, 32, 34, 35, 36, 37, 38, 39, 41, 42, 43, 45, 46, 47, 48, 49, 51, 52, 53, 54, 59, 62, 63, 64, 79, 82, 83, 92.

SECOND ALARM. — Boxes Nos. 57, 65, 68, 69, 71, 72, 73, 74, 75, 78, 91.

THE THIRD ALARM will be given by striking THREE strokes on the GONGS and BELLS.

THE SECOND ALARM call for Hook-and-Ladder Company No. 1 will be given by striking FOUR STROKES on the GONGS and BELLS.

THE SECOND ALARM call for Hook-and-Ladder Company No. 2 will be given by striking FIVE STROKES on the GONGS and BELLS.

DAILY AND MONTHLY CLASSIFICATION OF ALARMS.

The following table will show the location of fire-alarms by wards, from Dec. 1, 1875, to Nov. 30, 1876: —

Ward.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Totals.
1	2	1	1	. .	3	3	1	4	2	. .	. .	2	19
2	3	4	2	4	1	1	. .	1	2	2	2	. .	22
3	1	1	3	3	1	1	1	2	. .	3	1	3	20
4	3	3	2	1	. .	1	2	1	3	. .	. .	1	17
5	1	4	1	2	3	5	4	. .	3	. .	. .	3	26
Totals . .	10	13	9	10	8	11	8	8	10	5	3	9	104

The annexed table will show the day of the week on which alarms have occurred, and the number in each month, from Dec. 1, 1875, to Nov. 30, 1876: —

1875-76.	Dec.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Totals.
Sunday . .	.	1	2	3	2	1	1	. .	1	2	1	. .	14
Monday . .	.	2	2	. .	. .	4	. .	1	2	. .	. .	3	14
Tuesday . .	3	2	2	1	1	2	. .	1	. .	1	. .	1	14
Wednesday	5	2	1	. .	1	1	3	1	2	. .	. .	1	17
Thursday .	.	1	.	2	2	. .	1	. .	2	. .	2	2	12
Friday . .	2	5	.	1	1	. .	2	1	2	1	. .	2	17
Saturday .	.	.	2	3	1	3	1	4	1	1	. .	. .	16
Totals . .	10	13	9	10	8	11	8	8	10	5	3	9	104

HYDRANTS.

Located in Ward One.

Appleton Street, corner Highland.
Ash Street, corner New.
Baldwin Street, corner Baldwin Place.
Banks Street, corner Flagg.
Banks Street, corner Cowperthwaite.
Banks Street, corner Grant.
Bow Street, corner Linden (post).
Brattle Street, opposite the estates of Messrs. Longfellow and Hastings.
Brattle Street, corner Ash.
Brattle Street, corner Hilliard.
Brattle Street, corner University Press estate.
Brattle Street, corner Lowell.
Brattle Street, corner Fresh Pond Lane.
Brattle Street, opposite Mt. Auburn greenhouse.
Brattle Street, front of Mrs. Wyeth's estate.
Brattle Street, corner Willard.
Brattle Street, corner Story.
Brattle Street, corner Channing.
Brattle Street, corner Lakeview Avenue.
Brattle Street, corner Hawthorne (post).
Brattle Street, near Brighton (post).
Brighton Street, corner Mt. Auburn.
Brighton Street, corner Winthrop (post).
Brighton Street, corner Eliot (post).
Broadway, junction Cambridge Street.
Broadway, corner Prescott Street.
Broadway, corner Trowbridge Street.
Broadway, corner Quincy Street.
Broadway, corner Ware Street.
Broadway, corner Ellery Street.
Buckingham Street, opposite Stevens's barn.
Cambridge Street, corner Trowbridge.
Cambridge Street, front Scientific School.
Cambridge Street, corner Sumner.
Cambridge Street, corner Quincy (post).
Cambridge Street, opposite Felton (post).
Cambridge Street, corner Ellery (post).
Chauncy Street, 500 feet from North Avenue.
Church Street, corner Palmer.
Concord Avenue, junction Waterhouse Street.
Concord Avenue, corner Sparks Street.
Concord Avenue, opposite Craigie Street.
Concord Avenue, corner Follen Street (post).
Craigie Street, midway.
Craigie Street, near corner Sparks.
De Wolf Street, near Cowperthwaite.
Divinity Avenue, opposite Museum.
Dunster Street, corner South.
Dunster Street, corner Mt. Auburn.
Dunster Street, near Harvard Square (post).
Eliot Street, in elbow (post).
Eliot Street, corner Winthrop (post).
Ellery Street, corner Main.
Ellery Street, east side, midway between Broadway and Cambridge Street.
Elmwood Avenue, midway (post).
Everett Street, south side, midway between North Avenue and Oxford Street.
Fayerweather Street, corner Brattle.
Fayerweather Street, opposite Reservoir.
Foster Street, corner Brown.
Garden Street, near Chauncy (post).
Garden Street, corner Mason.
Garden Street, corner Wallace.
Grant Street, corner De Wolf.
Harvard Square, opposite Charles River Bank (post).
Harvard Street, corner Remington.
Harvard Street, opposite Harvard Block.
Harvard Street, opposite Linden (post).
Harvard College Grounds (three posts).
Hawthorne Street, corner Acacia (post).
Kirkland Street, near Baldwin, south side.

Kirkland Street, corner Trowbridge, south side.
Kirkland Street, corner Irving, south side.
Kirkland Street, corner Sumner, south side.
Kirkland Street, cor. Quincy, south side.
Kirkland Street, opposite Memorial Hall.
Lakeview Avenue, 500 feet from Brattle Street.
Lakeview Avenue, near Brattle Street (post).
Lakeview Avenue, corner Huron Street (post).
Lakeview Avenue, on hill (post).
Lakeview Avenue, near Engine House (post).
Langdon Street, in elbow (post).
Main Street, junction Harvard.
Main Street, corner Trowbridge.
Main Street, opposite Bay.
Main Street, near Baptist Church.
Mellen Street, corner Oxford.
Mill Street, corner Charles River.
Mt. Auburn Street, corner Brighton (post).
Mt. Auburn Street, corner Brewer.
Mt. Auburn Street, opposite Athens.
Mt. Auburn and Bow Streets.
Mt. Auburn Street, opposite De Wolf.
Mt. Auburn Street, 200 feet west of Cemetery gate, inside enclosure.
Mt. Auburn Street, corner Willard.
Mt Auburn Street, corner Sparks.
Mt. Auburn Street, opposite McDonald's Marble Works.
Mt. Auburn Street, near railroad stables, in Belmont.
Mt. Auburn Street, near Lowell (post).
Mt. Auburn Street, corner Dunster (post).
Mt. Auburn Street, corner Holyoke (post).
Mt. Auburn Street, corner Athens (post).
Mt. Auburn Street, corner Banks (post).
Mt. Auburn Street, corner De Wolf (post).
Mt. Auburn Street, corner Story (post).
Mt. Auburn Street, corner Hilliard (post).
Mt. Auburn Street, opposite City Building (post).
Mt. Auburn Street, near car stables, in Belmont (post).
Mt. Auburn Street, opposite Brewer (post).
Mt. Auburn Street, opposite Bath (post).
Mt. Auburn Street, near Coolidge Lane (post).
Mt. Auburn Street, corner Elmwood Avenue (post).
Mt. Auburn Street, corner Channing (post).
Murray Street, near Charles River.
North Avenue, corner Chauncy Street.
North Avenue, cor. Shepard Street (post).
North Avenue, corner Holmes Place.
North Avenue, corner Jarvis Street.
North Avenue, front of burial-ground (post).
North Avenue, corner Church Street.
North Avenue, corner Garden Street (post).
Oxford Street, near Jarvis.
Oxford Street, corner Everett.
Phillips Place, corner Berkeley Street.
Prescott Street, corner Harvard.
Prescott Street, between Harvard Street and Broadway (post).
Putnam Avenue, cor. Western Avenue.
Putnam Avenue, between Mt. Auburn and Main (post).
Putnam Avenue, corner Flagg Street (post).
Putnam Avenue, opposite Putnam Court (post).
Putnam Avenue, near Hews Street (post).
Putnam Avenue, corner Sands Street (post).
Quincy Street, midway between Harvard and Broadway (post).
Sands Street, opposite Planing Mill.
South Street, corner Dunster (post).
Sparks Street, corner Vassal Lane (post).
Sparks Street, corner Foster.
Sparks Street, opposite Charles T. Russell's.
Trowbridge Street, midway between Main and Harvard (post).
Waterhouse Street, opposite Follen (post).
Wendell Street, near Carver (post).
Worthington Street, near Engine House Water-works (post).

Located in Ward Two.

Amory Street, corner Summer.
Antrim Street, near Broadway.
Antrim Street, near Cambridge (post).
Antrim Street, midway (post).
Austin Street, corner Essex (post).
Austin Street, corner Prospect (post).
Austin Street, corner Temple (post).
Bigelow Street, midway between Main and Harvard.
Brewery Street, near Hastings (post).
Bristol Street, corner Portland (post).
Broadway, corner Highland Avenue.
Broadway, corner Third Street.
Broadway, corner Hancock Street.
Broadway, corner Antrim Street.
Broadway, corner Tremont Street.
Broadway, corner Elm Street.
Broadway, corner Dock Street.
Broadway, corner Dana Street.
Broadway, corner Ellsworth Avenue.
Broadway, corner Fayette Street.
Broadway, corner Amory Street.
Broadway, corner Norfolk Street.
Broadway, corner Boardman Street.
Broadway, junction Hampshire Street.
Broadway, opposite Thayer's Laboratory.
Broadway, near Broadway House.
Broadway, corner Clark Street (post).
Broadway, corner Third Street (post).
Broadway, corner Davis Street (post).
Broadway, corner Brewery Street (post).
Broadway, opposite Mason & Hamlin's building (post).
Broadway, near Sixth Street (post).
Broadway, corner Pioneer Street (post).
Cambridge Street, corner Harding.
Cambridge Street, corner Norfolk.
Cambridge Street, corner Willow.
Cambridge Street, corner Prospect.
Cambridge Street, corner Tremont.
Cambridge Street, opposite Fayette.
Cambridge Street, north side, near junction Hampshire and Cambridge.
Cambridge Street, opposite head of Maple Avenue.
Cambridge Street, corner McCabe.
Cambridge Street, corner Elm (post).
Cambridge Street, corner Winsor (post).
Cambridge Street, near Mr. Rafferty's house (post).
Cambridge Street, nearly opposite Highland Avenue (post).
Centre Street, opposite Dana Schoolhouse.
Clinton Street, near G. T. Gale's house (post).
Columbia Street, corner Washington.
Columbia Street, corner Lincoln.
Columbia Street, corner Market.
Columbia Street, corner Hampshire.
Columbia Street, corner Harvard.
Dana Street, corner Chatham (post).
Davis Street, corner Broadway.
Elm Street, opposite Lincoln (post).
Elm Street, corner Market.
Essex Street, westerly side, midway between Harvard and Austin.
Fayette Street, 500 feet from Broadway.
Hampshire Street, corner Amory (post).
Hampshire Street, near Somerville line (post).
Hampshire Street, corner Portland (post).
Harvard Street, corner Pine.
Harvard Street, corner Hancock.
Harvard Street, corner Dana.
Harvard Street, corner Clark.
Harvard Street, corner Moore.
Harvard Street, corner Norfolk.
Harvard Street, corner Portland.
Harvard Street, corner Brewery.
Harvard Street, corner Clinton.
Harvard Street, near R.R. crossing (post).
Harvard Street, between R.R. crossing and Brewery Street (post).
Harvard Street, opposite Davis (post).
Harvard Street, corner Cherry (post).
Harvard Street, corner Winsor (post).
Harvard Street, opposite Elm (post).
Harvard Street, corner Essex (post).
Harvard Street, corner Prospect (post).
Harvard Street, between Prospect and Inman Streets (post).
Harvard Street, corner Bigelow (post).
Harvard Street, corner Lee (post).
Highland Avenue, east side, midway.

Houghton Street, corner Bolton, in Somerville.
Hunting Street, 400 feet from Cambridge.
Inman Street, near Austin.
Inman Street, corner Harvard.
Inman Street, corner Broadway.
Inman Street, corner Summer.
Jefferson Street, corner Harding.
Jefferson Street, corner Warren (post).
Lee Street, midway between Main and Harvard Streets (post).
Main Street, corner Lee.
Main Street, corner Hancock.
Main Street, corner Dock (post).
Main Street, corner Essex.
Main Street, opposite Pleasant.
Main Street, corner Bigelow.
Main Street, junction Harvard.
Main Street, corner Pioneer (post).
Main Street, opposite Rawson & Hittinger's.
Main Street, opposite Pearl (post).
Main Street, Gale & Wood's driveway (post).
Maple Avenue, midway between Broadway and Cambridge Street.
Market Street, corner Union.
Moore Street, head of Hastings.
Norfolk Street, corner Hampshire.
Norfolk Street, corner Worcester.
Norfolk Street, head of Washington (post).
Oak Street, west side, near Somerville line.
Plymouth Street, corner York.
Portland Street, opposite Rolling Mill (post).
Prospect Street, opposite B. Tilton's.
Prospect Street, corner Broadway.
Prospect Street, corner Hampshire.
Prospect Street, corner Main.
Prospect Street, corner Gardner.
Prospect Street, opposite Schoolhouse, Somerville.
Prospect Street, corner Webster Avenue, Somerville.
Seckel Street, corner Webster Avenue (post).
South Street, opposite Willow, Somerville.
South Street, corner Gore, Somerville.
Tremont Street, near Wellington's house.
Tremont Street, near Cambridge.
Union Street, corner Hampshire.
Ward Street, corner Horace, Somerville.
Washington Street, corner Clark.
Webster Avenue, corner Elm.
Webster Avenue, corner Bristol.
Webster Avenue, corner Winsor.
Webster Avenue, corner Hampshire.
Webster Avenue, corner Plymouth.
Webster Avenue, corner Cambridge Street (post).
West Boston Bridge.
West Boston Bridge.
West Street, midway (post).
Winsor Street, corner Lincoln.
Winsor Street, corner Hampshire.
Winsor Street, corner Washington.
Winsor Street, near Somerville line (post).
Winsor Street, corner Broadway (post).

Located in Ward Three.

Bridge Street, corner Prison Point.
Bridge Street, corner Short.
Bridge Street, corner Short (post).
Bridge Street, corner Water.
Bridge Street, opposite Bay State Glasshouse.
Bridge Street, near Bay State Glasshouse (post).
Bridge Street, north side, opposite Braman, Shaw, & Co.'s.
Bridge Street, opposite Fourth (post).
Bridge Street, between Short and Water (post).
Bridge Street, near Cambridge (post).
Bridge Street, corner Water (post).
Bridge Street, corner East (post).
Cambridge Street, opposite First.
Cambridge Street, corner Carson.
Cambridge Street, corner Daily's Alley.
Cambridge Street, corner Third.
Cambridge Street, junction Bridge.
Cambridge Street, corner Sixth.

Cambridge Street, near railroad crossing (post).
Cambridge Street, opposite Seventh (post).
Cambridge Street, opposite No. 141 (post).
Cambridge Street, near Third (post).
Cambridge Street, corner Fourth (post).
Charles Street, corner Fourth.
East Street, corner North (post).
Eighth Street, corner Cambridge.
Fifth Street, corner Charles.
Fifth Street, corner Spring.
Fifth Street, corner Cambridge.
Fifth Street, corner Gore.
Fourth Street, corner Winter.
Fourth Street, corner Cambridge.
Fourth Street, corner Vine.
Fourth Street, corner Thorndike.
Gore Street, corner Fourth.
Gore Street, corner Carson (post).
Gore Street, corner Carson.
Gore Street, corner Seventh (post).
Gore Street, between Fourth and Fifth (post).
Gore Street, between Fifth and Sixth (post).
Lowell Railroad yard.
Munroe Street, corner Third (post).
North Street, corner East.
North Street, near Glass Company's cutting-shop.
Otis Street, corner First.
Otis Street, corner Third.
Otis Street, corner Seventh.
Otis Street, corner Ninth.
Prison Point Street, 50 feet north of Ice Sheds.
Prison Point Street, on railroad track, 300 feet from street.
Prison Point Street, on railroad track, 600 feet from street.
Prison Point Street, 400 feet from Bridge Street.
Prison Point Street, near Bridge (post).
Second Street, corner Thorndike.
Second Street, corner Otis.
Second Street, corner Cambridge.
Sixth Street, corner Gore.
Sixth Street, corner Potter.
Sixth Street, corner Charles (post).
Spring Street, corner Second.
Spring Street, corner Third.
Spring Street, corner Fourth.
Third Street, corner Vine.
Third Street, near Charles (post).
Third Street, corner Bridge (post).
Third Street, corner Potter.
Third Street, opposite Gas-works (post).
Thorndike Street, corner Sixth.
Thorndike Street, corner Fifth.
Thorndike Street, near Woodbury's mill (post).
Thorndike Street, corner Second (post).
Vine Street, corner Fifth.
Vine Street, corner Sixth.
Water Street, near Sugar-house.
Yard of J. P. Squire & Co. (post).

Located in Ward Four.

Austin Street, corner Douglass (post).
Austin Street, corner Norfolk (post).
Blackstone Street, west side, 100 feet from Avenue.
Brookline Street, corner Allston.
Brookline Street, corner Hamilton.
Brookline Street, corner Valentine.
Brookline Street, corner Putnam Ave.
Brookline Street, corner Erie.
Brookline Street, corner Franklin.
Brookline Street, corner Chestnut.
Brookline Street, near Henry (post).
Brookline Street, corner Decatur (post).
Brookline Street, corner Lopez (post).
Brookline Street, corner Watson (post).
Cherry Street, opposite Eaton.
Chestnut Street, corner Pearl.
Columbia Street, corner Austin.
Cottage Street, corner Pearl (post).
Fairmont Street, corner Andrew (post).
Franklin Street, corner Soden.
Franklin Street, corner Hancock.
Franklin Street, corner Bay.
Franklin Street, near the hill.
Franklin Street, corner Sidney.
Franklin Street, corner Magazine.

Franklin Street, near Putnam Avenue (post).
Front Street, junction State.
Front Street, corner Columbia (post).
Green Street, opposite Vernon.
Green Street, corner Putnam Avenue.
Green Street, corner Hancock (post).
Green Street, corner Bay (post).
Green Street, midway between Hancock and Vernon (post).
Green Street, corner Vernon (post).
Green Street, corner Western Avenue (post).
Green Street, corner Pearl (post).
Green Street, corner Brookline (post).
Hews Street, corner Putnam Avenue.
Kinnaird Street, corner Bay.
Magazine Street, corner Cottage.
Magazine Street, corner Putnam Avenue.
Magazine Street, corner Warland.
Magazine Street, corner Auburn.
Magazine Street, corner Park.
Magazine Street, corner Upton.
Magazine Street, opposite Hamilton.
Magazine Street, corner Florence.
Magazine Street, corner Green (post).
Main Street, corner Harrison (post).
Main Street, corner Columbia.
Main Street, corner Winsor.
Main Street, corner Norfolk.
Main Street, junction Austin.
Main Street, north side, opposite Kennedy's bakery.
Main Street, corner Washington.
Main Street, corner Brewery.
Main Street, corner Portland.
Osborn Street, corner State (post).
Osborn Street, corner Main (post).
Pacific Street, corner Sidney.
Pacific Street, near Albany.
Pearl Street, corner Lake.
Pearl Street, corner Putnam Avenue.
Pearl Street, corner Perry.
Pearl Street, corner Auburn.
Pleasant Street, corner Florence (post).
Pleasant Street, corner Upton.
Pleasant Street, corner Green.
Pleasant Street, corner Somerset.
Pleasant Street, corner Park.
Pleasant Street, corner Prince.
Pleasant Street, corner Pleasant Place.
Pleasant Street, corner Chestnut.
Pleasant Street, corner Franklin (post).
Portland Street, corner Main (post).
Putnam Avenue, opposite Ballard Place (post).
Putnam Avenue, near River Street (post).
Putnam Avenue, corner River Street (post).
Putnam Avenue, corner Walnut Court (post).
Putnam Avenue, corner Pleasant (post).
Putnam Avenue, between River and Pleasant Streets (post).
River Street, corner Franklin.
River Street, opposite Cottage.
River Street, opposite Laurel.
River Street, corner Blackstone.
River Street, opposite Fairmont.
School Street, corner Clark.
School Street, corner Portland (post).
School Street, corner Clark (post).
School Street, corner Moore (post).
Sidney Street, corner Allston.
Sidney Street, corner Putnam Avenue.
Sidney Street, corner Chestnut.
Sidney Street, corner State (post).
Sidney Street, corner Green (post).
Soden Street, corner Western Avenue.
Somerset Street, corner Andrew (post).
State Street, opposite Village (post).
State Street, near Howe's Factory (post).
Washington Street, corner Brewery (post).
Washington Street, corner Portland (post).
Washington Street, corner Moore (post).
Waverly Street, opposite Willard's.
Western Avenue, corner Howard Street.
Western Avenue, corner Kinnaird Street.
Western Avenue, corner Jay Street.
William Street, between Magazine and River Streets (post).

Located in Ward Five.

Arlington Street, 500 feet from North Avenue (post).
Beech Street, east side, 20 feet from Orchard.
Belmont Street, corner Montgomery (post).
Cedar Street, corner Spruce.
Cedar Street, opposite Norris.
Cedar Street, opposite greenhouse.
Concord Avenue, corner Madison Street.
Concord Avenue, opposite Bond Street.
Concord Avenue, corner Walden Street.
Concord Avenue, opposite Eames's estate (post).
Cogswell Avenue, corner Mead Street.
Crescent Street, corner Sacramento (post).
Donnell Street, corner Garden.
Dublin Street, 525 feet from Spruce.
Dublin Street, 620 feet from Walden.
Dublin Street, corner Walden.
Dublin Street, corner Sargent.
Dublin Street, corner Railroad.
Fairfield Street, opposite Mr. Whitney's.
Forest Street, corner Frost (post).
Garden Court, corner Dublin.
Garden Street, opposite Bond.
Harris Street, corner Forest (post).
Harvey Street, opposite Montgomery.
Hollis Street, in the elbow.
Hubbard Avenue, opposite brick block.
Hubbard Avenue, corner Raymond St.
Lambert Avenue, near North Avenue.
Lambert Avenue, corner Shawmut Avenue (post).
Linnæan Street, corner Avon.
Linnæan Street, corner Bowdoin.
Linnæan Street, corner Raymond.
Milk Street, corner White.
Milk Street, near Somerville line (post).
Montgomery Street, 300 feet from Harvey (post).
North Avenue, near railroad bridge.
North Avenue, corner Cogswell Avenue.
North Avenue, corner Allen Street.
North Avenue, corner Dover Street.
North Avenue, 300 feet west of Tannery.
North Avenue, corner Sacramento Street.
North Avenue, opposite Linnæan Street.
North Avenue, corner Chester Street.
North Avenue, corner Arlington Street.
North Avenue, corner Rice Street.
North Avenue, corner Cedar Street.
North Avenue, opposite Tannery.
North Avenue, near Walcott Richardson's gate.
North Avenue, corner Beech.
North Avenue, corner Frank Street (post).
North Avenue, corner Day Street.
North Avenue, near Blake's blacksmith shop (post).
Norton Street, midway.
Orchard Street, near Davenport (post).
Orchard Street, opposite Tenney Court.
Oxford Street, corner Forest.
Oxford Street, opposite Eustis Court.
Oxford Street, corner Sacramento.
Pemberton Street, 500 feet from North Avenue (post).
Pemberton Street, corner Fairfield (post).
Raymond Street, south side, near Mr. Dresser's estate (2).
Reed Street, 250 feet from Harvey.
Reed Street, opposite schoolhouse.
Rice Street, opposite L. L. Cushing's.
Richdale Avenue, corner Raymond St.
Richdale Avenue, near Raymond Street (post).
Roseland Street, corner Frost.
Shepard Street, corner Avon.
Spruce Street, corner Hollis.
Spruce Street, corner Jackson (post).
Spruce Street, corner Sargent.
Spruce Street, corner Montgomery.
Spruce Street, corner North Avenue.
Spruce Street, opposite schoolhouse.
Spruce Street, corner Clay.
Spruce Street, corner Clifton.
Tannery Street (3), between North Avenue and Almshouse (posts).
Tuttle Street, opposite Ladd's barn.
Walden Street, opposite Mead.
Walden Street, corner Hubbard Avenue.
Wallace Street, in the elbow.
Washington Avenue, corner Dexter.
Washington Avenue, corner Foxcroft Street.
Wyeth Street, corner Garden.

RESERVOIRS.

Located in Ward One.

Bow Street, centre of Square.
Brighton Street, corner Eliot.
Cambridge Street, nearly opposite Sumner.
College Yard.
Garden Street, north end of Appian Way.
Junction Garden Street and Concord Avenue, opposite Arsenal.
Kirkland Street, opposite Oxford.
Main Street, corner Dana.
Mt. Auburn Street, opposite the Church.

Located in Ward Two.

Broadway, head of Tremont.
Cambridge Street, corner Webster Ave.
Essex Street, corner Austin.
Harvard Street, opposite burial-ground.
Harvard Street, head of Cherry.
Harvard Street, corner Davis.
Harvard Street, corner Prospect.
Main Street, junction Broadway.
Norfolk Street, midway between Broadway and Hampshire.
Prospect Street, 175 feet north of Broadway.
Washington Street, corner Cherry.

Located in Ward Three.

Cambridge Street, 70 feet east of Third.
Gore Street, corner North Third.
Junction Bridge and Gore Streets.
New England Glass Company's Yard.
Otis Street, corner Fourth.
South Sixth Street, corner Spring.
Thorndike Street, corner Third.
Under New-England Glass Company's building.
Under Lowell R. R. Machine Shop.

Located in Ward Four.

Austin Street, corner Douglass.
Brookline Street, corner Auburn.
Junction Western Avenue and Pleasant Street.
Main Street, corner Austin.
Main Street, corner Brookline.
Main Street, junction Western Avenue and River Street.
Main Street, front of Univer. Church.
Pearl Street, corner Franklin.
School Street, corner Cherry.
Washington Street, corner Pine.

Located in Ward Five.

North Ave., near Engine House No. 4.
In Square, opposite Porter's Hotel.

REPORT

OF

GEORGE L. CADE,

SUPERINTENDENT OF STREETS.

To the Honorable City Council: —

The undersigned asks leave to submit for your consideration his Thirteenth Annual

REPORT.

The Appropriation for Streets for the financial year ending Nov. 30, 1876, was	$90,000 00
Transferred to Bridges	1,200 00
	$88,800 00
Amount expended	88,794.16
Balance unexpended	$5.84

The Appropriation for this department has been expended as follows: —

Superintendent's Salary	$2,000 00
Horses, Harnesses, Shovels, and Incidentals	2,355 57
Gravel and Stone	30,678 43
Labor with Men and Teams	45,309 61
Iron-work and Repairs on Carts, &c.	2,103 59
Hay and Grain	4,088 03
Lumber	753 32
Horse-shoeing and Repairs	724 44
Hardware, &c.	781 17
	$88,794 16

The streets of Cambridge, with but a very few exceptions, are in good condition. Extensive repairs will have to be made on North Avenue, from the Fitchburg Railroad to Cedar Street, in the spring; also on Walden Street, between the Railroad Bridge and Raymond Street.

I would again call your attention to the necessity of paving Main Street from near Third Street to Central Square, as it is almost impossible to keep this street in good condition unless it is paved. I think that contracts could be made this winter for the block stone at a very low rate. If it is not thought advisable to do so much in one year, I would ask that provision be made for paving the southerly side of the same at least, at an estimated cost of thirty thousand dollars for the paving alone. It would certainly be economy to do this. Prison Point Bridge Street needs to be paved, between the Boston and Lowell Railroad and the Draw; and a sewer should be constructed to provide for the surface-drainage. The cost would probably be about six thousand dollars for the paving alone. 30,076 yards of paving have been laid, and 12,674 feet of edgestone have been set, during the past season.

The Appropriation for Paving for the financial year ending Nov. 30 was	$20,000 00
Amount expended	19,971 49
Balance unexpended	$28 51

The Street Department is still in need of a suitable quality of gravel for streets.

A contract was made last spring for the furnishing of blue gravel, delivered on the streets, at one dollar and twenty cents per yard; but I was obliged to annul the contract on the 11th of November on account of the clay material which was being delivered, and have since then purchased a better article for one dollar per yard. With an appropriation of seventy-five thousand dollars, I have no doubt the streets can be kept in order the coming year. I am of the opinion that it will require not less than fifteen thousand dollars for *repairs* on paving. The regular force employed in the Street Department at the present time is forty-four men and twenty-six horses.

The following streets have been graded during the past year: —

Allston Street, partially.
Appleton Street, "
Arlington Street, its whole length.
Ash Street, partially.
Auburn Street, "
Austin Street, "
Baldwin Street, "
Banks Street, "
Beaver Street, "
Bigelow Street, its whole length.
Blackstone, partially.
Bow Street, "
Brattle Street, its whole length.
Brattle Square, wholly.
Brewery Street, partially.
Brighton Street, its whole length.
Broadway, " "
Brookline Street, " "
Cambridge Street, " "
Carson Street, partially.
Cherry Street, "
Cedar Street, "
Clark Street, "
Columbia Street, "
Concord Avenue, "
Cottage Street, "
Craigie Street, "
Central Square, "
Dana Street, "
Davis Street, "
Douglass Street, "
Dublin Street, "
Dunster Street, "
Eliot Street, "
Ellsworth Avenue, "
Elm Street, "
Essex Street, its whole length.

Fairmont Street, partially.
Fifth Street, "
First Street, "
Flagg Street, "
Florence Street, its whole length.
Fourth Street, partially.
Franklin Street, "
Garden Street, "
Gore Street, "
Grant Street, "
Green Street, "
Hamilton Street, "
Hampshire Street, its whole length.
Hancock Street, partially.
Harvard Street, "
Hastings Street, "
Highland Street, "
Highland Avenue, "
Holyoke Street, "
Howard Street, from Western Avenue northerly.
Inman Street, its whole length.
Jay Street, from Western Avenue northerly.
Jefferson Street, partially.
Kinnaird Street, "
Kirkland Street, "
Lake Street, "
Lakeview Avenue, "
Lawrence Street, "
Lee Street, "
Lopez Street, "
Magazine Street, from River to Putnam Avenue.
Main Street, its whole length.
Milk Street, from North Avenue to Somerville line.
Moore Street, partially.
Mt. Auburn Street, "
Norfolk Street, from Main to near Harvard.
North Street, partially.
North Avenue, "
Otis Street, "

Oxford Street, partially.
Pearl Street, "
Pleasant Street, "
Portland Street, "
Prison Pt. Street, "
Prospect Street, "
Putnam Avenue, "
Quincy Street, its whole length.
Reed Street, partially.
Reservoir Street, "
River Street, "
Sacramento Street, partially.
Sands Street, from Putnam Avenue to Banks.
School Street, partially.
Second Street, "
Shepard Street, its whole length.
Short Street, partially.
Sixth Street, "
Soden Street, "
South Street, "
Sparks Street, its whole length.
Spring Street, partially.
Spruce Street, "
Sumner Street, "
Third Street, "
Thorndike Street, "
Tremont Street, "
Trowbridge Street, "
Tufts Street, from Magazine to Pearl.
Walden Street, partially.
Wallace Street, its whole length.
Warren Street, partially.
Washington Street, "
Watson Street, "
Western Avenue, "
Willard Street, "
Winter Street, "
Wright Street, "
Wyeth Street, "

The following streets have been accepted during the year: —

Name.	Date.	Width.	For what Distance.
	1876.	Feet.	
Shepard Street	Jan. 1	40	From North Avenue to Avon Street.
Springfield Street . .	May 6	40	Cambridge Street to Somerville line.
Binney Street	May 6	50	Portland Street to Ninth Street.
Seventh Street	May 6	40	Cambridge Street to Thorndike Street.
Wright Street	May 11	28	North Avenue to Estate of M. Corcoran.
Park Street	July 6	40	Magazine Street to Pleasant Street.
Putnam Avenue . . .	Oct. 9	40	Magazine Street to Pleasant Street.
Otis Street	Dec. 22	40	Seventh Street to Ninth Street.
Eighth Street	Dec. 22	40	Cambridge Street to Thorndike Street.
Ninth Street	Dec. 22	50	Cambridge Street to Otis Street.
Chestnut Street . . .	Dec. 16	40	Magazine Street to Pleasant Street.
Fairmont Street . . .	Dec. 23	30	Magazine Street to Pleasant Street.
Holly Avenue	Dec. 28	30	Wyeth Street to Madison Street.

The following streets have been widened and laid out during the year: —

Name.	Date.	Width.	For what Distance.
	1876.	Feet.	
Main Street	June 15		At the corner of Prospect Street.
Putnam Avenue . . .	Dec. 30		At the corner of Western Avenue.
	1877.		
Shepard Street . . .	Jan. 1	40	From North Avenue to Shepard Street.

Schedule of Property.

Twenty-four Horses	$7,800 00
Six Double Harnesses	400 00
Three Wagon Harnesses	110 00
Twenty-six Collars	130 00
Fourteen Sets Chains, &c.	210 00
Ten Saddles, &c.	200 00
Twenty-four Pairs Hames	144 00
Seventeen Carts	2,175 00
One Caravan	150 00
Amount carried forward	$11,319 00

Amount brought forward	$11,319 00
One Set of Runners	75 00
One Plough	5 00
Utensils for Work on Streets, &c.	400 00
Stable Furniture	50 00
Eight Snow-Ploughs	240 00
Stone-Crusher and Steam-Engine	4,000 00
Four Street-Rollers	1,200 00
Five Sleds	375 00
One Large Wagon	125 00
Lot Paving Stone and Blocks	2,000 00
Lot Edgestone and Corners	400 00
Twenty-four Thousand Paving Brick	264 00
Five Hundred Yards Cracked Stone	1,000 00
Lot of Stone for Cracking	600 00
Railroad Track on Cambridge Street Lot	770 00
Lot of Lumber	75 00
Three Express Wagons and Harnesses	400 00
	$23,298 00

Bridges.

The Appropriation for Bridges for the financial year ending Nov. 30 was	$8,000 00
Additional Appropriation	1,200 00
	$9,200 00
Amount expended	9,194 82
Balance unexpended	$5 18

All the bridges under my charge I believe to be in very good condition, with but one exception; that is, Brookline Bridge and its pier. This bridge will require new planking in the spring, and considerable repairs will be required on the pier. I have contracted for the lumber for doing this work. Repairs have been made on the following bridges: —

Cambridge Great Bridge.
Western Avenue Bridge (nearly all rebuilt).
River Street Bridge.

Brookline Bridge.
Third Street Bridge.
Sixth Street Bridge.
North Avenue Bridge.

I think that an appropriation of nine thousand dollars will be sufficient to meet the requirements of this department for the coming year.

Respectfully submitted.

GEORGE L. CADE,
Superintendent of Streets.

REPORT

OF

GEORGE H. COPELAND,

CHIEF OF POLICE.

Office of the Chief of Police,
Cambridge, December, 1876.

To the Honorable City Council of Cambridge.

Gentlemen, — I have the honor to submit the Annual Report of the doings of the Police Department for the year ending Nov. 30, 1876.

Whole Number of Arrests		1,629
Males	1,456	
Females	173	
Residents	1,330	
Non-residents	299	
Adults	1,361	
Juvenile Offenders	268	

Food and lodging have been furnished at the several station-houses to 5,121 persons, of whom 4,919 were males, and 202 females.

The following table will show the offences for which arrests have been made: —

Assault and Battery	281	Cruelty to Animals	5
Assault on an Officer	17	Common Drunkards	13
Assault Felonious	9	Common Railer and Brawler	2
Attempt to break and enter	4	Carrying Concealed Weapons	2
Arson	3	Concealing Mortgaged Property	2
Adultery	1	Drunkenness	586
Abandoning Child	1	Disturbance of the Public Peace	74
Breaking and Entering	35	Disturbing Public Meeting	5
Bastardy	9	Defrauding Hotel Keeper	2
Burglary	1	Escaped Prisoners	3

Evading Car-Fare	9	Perjury	1
Fraudulent Attempt at Registration,	2	Receiving Stolen Property	3
Fornication	4	Refusing to assist Officer	2
Forgery	2	Robbing Birds' Nests	1
Highway Robbery	2	Stubborn Children	7
Insanity	23	Suspicious Persons	4
Idle and Disorderly Person	1	Sodomy	1
Keeping Unlicensed Dogs	17	Stealing a Ride	2
Larceny	130	Vagrancy	36
Larceny from Building	40	Violation of City Ordinances	62
Larceny from the Person	6	Violation of the Lord's Day Law	14
Lewd and Lascivious Persons	4	Violation of the Liquor Law	93
Malicious Mischief	51	Wilful Trespass	40
Murder	1	Walking on Railroad Track	2
Obtaining Goods by False Pretences,	1		
On Capias	11	Total	1,629
On Bail Bond	2		

A portion of the miscellaneous work of the department I have classified as follows: —

Amount of Property reported stolen	$5,298
Amount recovered by this Department	$2,982
Accidents reported where the Injured Parties were assisted	49
Alarms of Fire given by Officers	18
Stores found open in the night, and secured	59
Dead Bodies found and taken care of	10
Dead Bodies recovered by grappling	6
Defects in Water and Gas Pipes reported	119
Defects in Streets and Sidewalks reported	170
Dogs killed	37
Disturbances suppressed	69
Fires extinguished without alarm	6
Intoxicated Persons assisted home	89
Lost Children returned to friends	91
Stray Teams taken care of	22
Search Warrants for Liquors served	156

At all fires, portions of this department have been present, their numbers corresponding to the necessity for their services; and these services have been such, that I have received the praise of citizens and the thanks of the Chief Engineer of the Fire Department.

Total cost of the Department for the year:—	
Appropriation	$72,000 00
Expenditures:—	
Pay of Chief	$2,000 00
Sundry Officers' Services	64,846 50
Fuel for Station Houses	1,400 59
Bills of Cambridge Gaslight Company	558 86
Horse-keeping	600 00
Horse-shoeing	56 49
Repairs of Station Houses	329 17
Incidental Expenses	1,638 92
Total	$71,430 53
Amount paid into the Treasury on account of Services on Warrants, Witness Fees, &c.	4,889 33
Balance, showing actual cost	$66,541 20

The organization of the force, and its numerical strength, are the same as last year; namely, one chief, four captains, and fifty-five patrolmen. The hours of duty are divided as follows: from 8, A.M., to 6, P.M., three captains (one in each district) and nine patrolmen are on duty. From 6, P.M., to 1, A.M., twenty-one officers are on patrol duty; and from 1, A.M., to 8, A.M., nineteen officers are on patrol duty. Three officers (one in each district) are assigned to duty in the station-houses; and their hours of duty are from 6, P.M., to 8, A.M.; thus covering the hours when the three captains are off duty. There are also two officers whose hours of duty are from 9, P.M., to 4, A.M.; and Capt. Hagar, assisted by officer Simonds, has the general supervision of the whole night force.

I again renew my recommendation of last year for the passage of an ordinance establishing the qualifications (so far as age and physical ability are concerned) necessary to render an applicant eligible to become a member of this force, and also recommend the appointment of at least two sergeants to assist the night captain in the discharge of his duty.

The seizure clause of the liquor law, which went into effect last spring, has been of great assistance in the enforcement of

said law; and, so far as I know, there is not an unlicensed place in the city where intoxicating liquors are openly sold.

That there are many places call Kitchen Bar-rooms, where a bottle of liquor is carried in the clothing of the proprietor or proprietress, to be dealt out to those who have the pass-word, I have no doubt. These places are very difficult to get at; but, in most cases, their business has been so much reduced, that it is carried on more in the spirit of defiance to the officers than for profit. In the enforcement of this law, most of the officers have shown a commendable zeal.

The different station-houses are all in good condition, with the exception of the small lock-up at the Lower Port, which is entirely without necessary accommodations. As the rest of the building is unoccupied, this might be remedied at small cost, and should be done as soon as possible.

The general standard of efficiency of the force has been maintained during the last year; and our citizens have received a reasonable protection, and consequent immunity from depredation.

My thanks are due, and are hereby returned, to the officers under my command, for their cheerful compliance with all the requirements of duty; and to the Police Departments of neighboring cities for assistance cheerfully rendered when opportunity offered.

Respectfully submitted.

GEORGE H. COPELAND,
Chief of Police.

REPORT

OF

B. F. NOURSE,

SUPERINTENDENT OF LAMPS.

To his Honor the Mayor and the City Council.

Gentlemen, — I herewith submit my Report of this department from May 1 (the date at which I assumed the duties of Superintendent) to Nov. 30, covering a period of seven months. At the commencement of my duties as Superintendent, I was impressed with the fact that I was about entering upon a new pursuit, of the duties and details of which I was ignorant. By an arrangment with my predecessor, Mr. Cahill, he agreed that he would impart to me the necessary information ; but, for some reason best known to himself, the information was withheld; and, quoting from his Report of 1874, "I was forced to take charge of the department without any knowledge of its several details." By the kindness of Roland Litchfield, sen. (to whom I am under many obligations, who first organized and superintended the department, and whose knowledge of its workings and details was cheerfully communicated to me), and the efficiency and faithfulness of the men employed to take charge of the lamps (some of whom have been in the employ of the city since the organization of the department), the apparent difficulties of the situation were soon overcome; and at the present time the department is believed to be in thorough working order.

The cost of each post and lantern, when I took charge of the department, was twenty-three dollars. By request of the Committee on Lamps, I issued proposals for furnishing the city

with posts and lanterns; and, from estimates received, a contract was made with D. U. Chamberlin & Co. for furnishing the city with posts of the heaviest pattern, and lanterns made of fourteen-ounce copper, set and painted, for eighteen dollars and fifty cents each, — a reduction of four dollars and fifty cents per post from the price paid by my predecessor. The number of lamps on the streets and commons of the city is as follows: —

District One,	303 gas,	17 kerosene.		
District Two,	302 gas,	31 kerosene.		
District Three,	103 gas,	15 kerosene.		
	708	63	Total . .	771

Twenty-five of the above have been added since May 1. Six of this number were placed upon the common in Ward One, and are lighted with kerosene; four were placed upon the common in Ward Two, and are lighted with gas; one was located at the corner of Spring and Second Streets, near the House of Correction, in Ward Three, and is lighted with gas. All these lamps were paid for by the city. The other fourteen were located in different parts of the city, paid for by the abutters, and are lighted with gas. Thirty lamp-posts have been reset; two that were broken have been replaced with new posts; and three have been removed from their original position, and relocated.

In August last, by direction of the Committee on Lamps, and under the supervision of the Superintendent, the lamp-posts and lantern-frames throughout the city were provided with a substantial coat of varnish and paint; and shortly after, on the 24th, 25th, and 26th of the month, the Chairman of the Committee (Alderman Thurston), with Councilman Tilton and myself, personally inspected every lamp-post and lantern, finding them generally in good order, and verifying by count, in each district, the number as returned by the lamp-lighters.

The increase of street-lamps necessarily involves a constantly increasing and continuous expense to the city. Every new lamp-post erected adds an additional cost to the department of about thirty-one dollars per year.

In the Report of the Superintendent of Lamps of Boston for the year 1875, he says, "The public lamps are burned every night throughout the year, a total of 3,849½ hours each."

Under our system, as established and followed, there are about sixty nights in the year when the street-lamps are not lighted, the light of the moon being considered sufficient for all purposes. On the other three hundred and five nights of the year, three hundred of our lamps on the main streets of the city are lighted at sunset, and are extinguished, as the moon changes, from twelve o'clock at night to six o'clock in the morning. Four hundred and seventy-one lamps on the cross-streets are never left burning after twelve o'clock; and this custom of extinguishing the lights on some of the streets at twelve o'clock, and leaving them burning on others until morning, has been the cause of considerable dissatisfaction and complaint from some of the citizens. In order that the City Council may have the necessary information, should it deem it proper to make any change in the method of lighting, I herewith submit an estimate of cost for burning the entire number of street-lamps all night, and an estimate of cost for continuing the present system of lighting.

The difference of cost for burning the entire number of street-lamps all night would be the additional cost of the gas for four hundred and seventy-one lamps from twelve o'clock to daylight, which would average through the year four and one-half hours each per night, making an additional cost for the consumption of gas, at one cent per hour, of $6,463.00, less a reduction in price for lighting of $1,188.00; making in round numbers an addition of $5,275.00 to the appropriation for lighting streets.

The appropriation for lighting streets for the year 1876 was $21,400.00, which fell short of the actual expenses $966.00; and on the basis suggested, of burning the entire number of street-lamps all night, for 305 nights in the year, an appropriation of $29,900.00 would be necessary; and an appropriation of $23,800.00 would be necessary for continuing the present system of lighting. The expenses of the department from May 1 to Nov. 30, 1876, inclusive, are as follows: —

For Gas	$6,708 95
Care of Lamps, and lighting . . .	3,349 76
Posts, Lanterns, and Repairs . . .	825 68
Kerosene, Matches, Ladders, &c. . .	386 88
Printing	15 00
Painting Lamp-posts and Lanterns . .	164 56
Superintendent's Salary	233 33
Total	$11,684 16

Leaving $10,681.89 of the appropriation as having been expended by my predecessor in the five preceding months. The average cost of burning gas was 5¾ cents per night for each lamp. The cost of each lamp burning kerosene was 1½ cents per night. Seven men are employed to light the lamps and clean the lanterns; and they are faithful and efficient in the performance of these duties: they are paid 50 cents per month for each lamp, and 33 cents per month extra for each lamp that is left burning all night.

Petitions are now pending for ten more lamps in various parts of the city: should these petitions be granted, an addition of four hundred dollars to the appropriation for lighting streets will be necessary.

B. F. NOURSE,
Superintendent of Lamps.

CAMBRIDGE, Nov. 30, 1876.

REPORT

OF

WILLIAM S. BARBOUR,

CITY ENGINEER.

CITY OF CAMBRIDGE, OFFICE OF CITY ENGINEER,
Dec. 20, 1876.

TO THE HONORABLE THE CITY COUNCIL.

Gentlemen, — In accordance with Section 8 of the ordinance relating to City Engineering, I herewith submit my report of the operations and expenses of that department for the year ending Nov. 30, 1876.

STREETS.

There have been laid out by the City Council for public use the following streets, described in the accompanying table: —

STREETS LAID OUT FROM DECEMBER 15, 1875, TO DECEMBER 27, 1876.

LOCALITY.			DESCRIPTION.				
Name of Street.	From	To	Width in Feet.	When laid out.	Date of Plan.	Plan and Profile by	Length in Feet.
Binney Street	Portland Street	Ninth Street	50	May 6, 1876.	June, 1875.	City Engineer	880.57
Chestnut Street	Magazine Street	Pleasant Street	40	Dec. 13, 1876.	Oct. 25, 1875.	E. F. Bowker	544.30
Eighth Street	Cambridge Street	Thorndike Street	40	Dec. 20, 1876.	Nov. 14, 1876.	W. A. Mason	456.94
Fairmont Street	Magazine Street	Pleasant Street	30	Dec. 13, 1876.	Feb. 1871.	W. S. Barbour	523.12
Holly Avenue	Madison Street	Wyeth Street	30	Dec. 27, 1876.	Oct. 10, 1876.	W. A. Mason	377.63
Ninth Street	Cambridge Street	Otis Street	50	Dec. 20, 1876.	Nov. 14, 1876.	W. A. Mason	225.85
Otis Street	Seventh Street	Ninth Street	40	Dec. 20, 1876.	Nov. 14, 1876.	W. A. Mason	391.37
Park Street	Magazine Street	Pleasant Street	40	July 6, 1876.	Feb. 1871.	W. S. Barbour	515.81
Putnam Avenue	Magazine Street	Pleasant Street	40	Oct. 9, 1876.	May 3, 1876.	Arthur Hodges	544.57
Seventh Street	Cambridge Street	Thorndike Street	40	May 6, 1876.	Dec. 15, 1875.	E. F. Bowker	496.91
Shepard Street	North Avenue	Avon Street	40	Jan. 1, 1876.	Nov. 30, 1875.	City Engineer	571.00
Springfield Street	Cambridge Street	Somerville line.	40	May 6, 1876.	Dec. 21, 1875.	Barbour & Hodges	225.68
Wright Street	North Avenue	Estate of M. Corcoran	28	May 11, 1876.	Nov. 3, 1875.	W. A. Mason	430.00

There have thus been added to the public streets 244,246.7 square feet of area, and a length of 1.171 miles.

Thirty-four stone bounds have been set, principally in the Franklin and Cowperthwaite Street Districts. Lines and grades of streets have been furnished on 131 applications, a number of them requiring extensive surveys to determine lines not previously established, or imperfectly recorded. Arrangements have been made with the Boston and Albany Railroad to grade that portion of Binney Street lying between Portland and Ninth Streets; which work will soon be carried out.

SEWERS.

The demand for sewers the present year has not been large. The Binney Street Sewer, under contract with W. C. Poland & Son in 1875, and by further agreement continued to June 1, 1876, has been completed. The total cost at the close of the fiscal year was $155,236.80, including the dredging of Broad Canal, diverting the Hampshire Street Sewer outlet, and ballasting that portion of the sewer enclosed in the coffer-dam and the wooden outlet. This sum includes $88,287.25 paid out of the appropriation for the Binney Street Sewer in 1875. The Binney Street Sewer, so called, is a large trunk sewer, built to take the drainage of sewers formerly emptying into Broad Canal, and is 6,249.88 feet in length.

The area from which drainage is received by this sewer is a little over 600 acres, comprising nearly the whole of Ward Two, and portions of Wards Three and Four. Soon after its completion, serious apprehensions were felt as to the safety of the coffer-dam, in which the sewer was built across the flats. It was deemed necessary to ballast it; and an appropriation of $12,000.00 was made for that purpose. A contract was entered into with Messrs. Hall, Black, & Co., Aug. 3, 1876, who immediately commenced work. A delay of several weeks was soon caused, a question having arisen as

to the matter of compensation for tide-water displaced. This was finally adjusted by the Harbor Commission, allowing Messrs. Hall, Black, & Co. to dredge in the channel of Charles River, thus making compensation, and relieving the Cambridge Improvement Company, to which a license for the filling the same flats had been granted. The work has been vigorously pushed to completion, the gravel filling having been covered with slate stone rip-rap from West Somerville. All the work has been well done, the stone being furnished on a sub-contract by Cornelius O'Connors of Cambridge.

Bay Street Sewer.

A contract for this sewer, awarded to Samuel McCulloch last season, and not completed, has been finished the present.

Florence Street Sewer.

A contract for this sewer, awarded to Stephen H. Tarbell & Co., has also been completed.

Western Avenue Tide-Gates and Sewer.

Early in the season, an examination of the tide-gates of the Western Avenue Sewer showed them to be in a very bad condition, and practically useless. Plans were prepared, and a contract made with O. P. Roberts, for a double set of perfect-acting tide-gates, a section of brick sewer of the enlarged size suited to the drainage-area, and the necessary wooden outlet.

This work was satisfactorily completed in July, 1876. The size of the new portion of sewer built is 42″ by 48″; the size of the connecting sewer at Jay Street is 36″; while the intervening portion in Western Avenue is only about 20″, and entirely inadequate to the demands upon it. Many and well-founded complaints have been made the past season. The inhabitants of the Franklin Street District will be subject to the flooding of cellars until such time as this portion of sewer is rebuilt of suitable size.

Thorndike, First, and Cambridge Street Sewers.

Considerable inconvenience has been felt by owners of property on Thorndike and First Streets, owing to the defective

state of the sewers in those streets. In consequence of the original bottom being of a very soft material, by the raising of the grade of the streets a great weight has been placed upon the sewers, and they appear to have settled: in places the top of the sewer is below the bottom of the present outlet, which outlet is also through private lands, and empties into a dock in the rear of Bridge Street.

For some time, no sewerage water appears to have been discharged from this outlet, and the sewer is probably obstructed.

The proper outlet for this section is by a sewer commencing at the Bridge Street Sewer, at the intersection of Bridge and Cambridge Streets, and extending westerly through Cambridge Street to First, through First to Thorndike, and through Thorndike to near Second Street: this will be somewhat expensive in proportion to the size, owing to the nature of the bottom, which will render a pile foundation necessary for a considerable portion of it. This sewer should be constructed the coming season.

Bridge Street Sewer.

In accordance with an Act passed May 8, 1875, entitled "An Act in addition to an Act for the Abatement of a Nuisance in the Cities of Cambridge and Somerville, and the Preservation of the Health of said Cities," plans have been prepared and approved, by the City Engineer of Somerville and the Board of Harbor Commissioners, for the extension of the outlet of the Bridge Street Sewer to deep water in Charles River. Nothing has been done towards carrying out the plan, as the City of Somerville failed to act with us in the matter, the terms of the Act requiring concurrent action: thus Cambridge has been unable to abate a nuisance which it would have cheerfully done, had it been in its power. One step has, however, been taken in anticipation of the extension and the sealing the mouth of the sewer which will result from a submerged outlet; and that is the connecting of the sewer with the chimney of the Lowell Railroad Machine Shop. An eighteen-inch pipe was laid from the crown of the arch of the sewer just west of the gate-chamber, crossing to, and thence under, the northerly walk, and under the floor of the shop, directly into the chimney.

A trap in the floor, and a valve and door in the pipe, afford a ready means of examination. Thus far there has been a strong draught through the pipe, which has removed the gases to a considerable extent from the sewer: it is, however, designed and expected to be of more service when the outlet of the sewer is submerged. The whole expense has been borne by the City of Cambridge.

There have been licensed by the Committee on Sewers and Drains, for the year 1876, nineteen persons as drain-layers, as follows: Ward One, 3; Ward Two, 7; Ward Three, 2; Ward Four, 6; Ward Five, 1. There have been issued to these drain-layers, up to Nov. 30, 258 permits to enter private drains into public sewers, as provided by the ordinance. 1,164 catch-basins have been cleaned, the contents being carted to the nearest available vacant lot. As the population increases, the finding of suitable places of deposit becomes more difficult, and adds to the cost of cleaning, and will perhaps, in time, require the removal in close carts out of the city limits. 3,625 loads have been removed at a cost of $1,961.75, or $54\frac{1}{10}$ cents per load.

There have been built with the sewers constructed, and by special orders, 14 manholes, 48 catch-basins, and 17 temporary catch-basins of wood, for surface drainage of the low land districts. There have been added to the length of the sewers 6,262.57 feet, equal to 1.186 miles, making a total length of sewers in the city of 59.344 miles.

The appropriations made for sewers were: —

Sewers and Drains	$25,000 00
Binney Street Sewer	67,000 00
Bridge Street Sewer	4,075 00
Total	$96,075 00

The expenditures have been: —

Sewers as per table (except Binney Street)	$9,802 65
Binney Street Sewer	66,949 55
Amount carried forward	$76,752 20

Amount brought forward . . .	$76,752 20
Bridge Street Sewer	79 61
Cleaning Catch-Basins	1,961 75
Care and Repair, and building Catch-Basins	5,589 62
Total to Nov. 30	$84,383 18

The following table will give the detail of sewers constructed in 1876: —

SEWERS CONSTRUCTED FROM DECEMBER 1, 1875, TO DECEMBER 1, 1876.

LOCATION.			CONSTRUCTION.							Total Cost.
Street.	From	To	Contractor.	Material.	Size in Inches.	Catch Basin.	Man-holes.	Inlets.	Length in Feet.	
Allston	Extended . . .	Easterly. . . .	Samuel McCulloch . .	Portland stoneware	12			6	112.50	$117.98
Binney	Comm'ers' Line	Commer'l Ave.	W. C. Poland & Son. .	Timber	96 x 90				256.42	‡155,236.80
Binney	Commer'l Ave.	Ninth Street. .	W. C. Poland & Son. .	Brick and timber .	96 x 100		4	241	†3,026.36	
Binney	Ninth Street. .	Portland Street	W. C. Poland & Son. .	Brick	90 x 90		1	68	880.50	
*Broadway. . . .	Hampshire St..	Sixth Street. .	W. C. Poland & Son. .	Brick	48		1	44	993.00	
Bridge-st.Sewer Ventilator.	Bridge Street .	B. &L. R.R. chimney.	City Engineer.	Portland pipe & galv. iron.	18				173.50	402.90
Bay	Franklin Street	Green Street .	Samuel McCulloch. . .	Portland stoneware	15		1	6	198.00	401.60
Chauncy.	Extended . . .	Southerly . . .	Samuel McCulloch. . .	Portland stoneware	12			4	66.50	76.34
Franklin	Bay Street. . .	Westerly . . .	Samuel McCulloch. . .	Cement	12			21	394.80	441.06
Franklin	Extended . . .	Westerly . . .	Samuel McCulloch. . .	Vitrified pipe . . .	8			4	65.00	53.15
First	Thorndike St. .	Near Otis St. .	City Engineer.	Wood	14 x 18				149.00	269.45
Florence	Pleasant Street	Easterly. . . .	S. H. Tarbell & Co. . .	Cement	12			21	522.90	1,047.38
Garden	Donnell Street.	Easterly. . . .	Samuel McCulloch. . .	Portland stoneware	12	1		9	200.00	228.40
*Hampshire . . .	Portland Street	Broadway. . .	W. C. Poland & Son. .	Brick	48		1	40	515.60	
Madison St. and Concord Ave.	Holly Street. .	Near Wyeth St.	Joseph Fox.	Cement	12		2	29	600.00	929.90

Mt. Auburn . . .	Dunster Street.	Brighton Street	Samuel McCulloch. . .	Portland stoneware	10			8	195.50	173.52
Prescott.	Broadway. . .	Southerly . . .	Samuel McCulloch. . .	Vitrified pipe . . .	10	1		10	314.00	274.76
*Portland	Hampshire St..	Binney Street .	W. C. Poland & Son. .	Brick	90 x 90		2	45	577.80	
Portland	Binney Street .	Plymouth St. .	O. P. Roberts	Brick	36		1	21	255.50	850.00
Plymouth	Portland Street	Nr. Berkshire St	Samuel McCulloch. . .	Portland stoneware	10			15	310.00	324.40
Putnam Ave. . .	Pleasant Street	River Street. .	City Eng., special order	Portland stoneware	15	4		52	770.80	1,254.75
Sparks-st. Court.	Concord Ave. .	Angle	Samuel McCulloch. . .	Portland stoneware	12	1	1	6	207.00	566.06
Sparks-st. Court.	Angle	Sparks Street .	Samuel McCulloch. . .	Portland stoneware	10			15	308.00	
Western Ave. . .	Charles River .	E. Gate Chamb.	O. P. Roberts	Wood	40 x 44				100.00	2,391.00
Western Ave. . .	Gate Chamber.	Nr. Bl'kstone St.	O. P. Roberts	Brick and invert. .	42 x 48			10	†202.20	

SEWERS CONSTRUCTED BY PRIVATE PARTIES UNDER THE SUPERVISION OF CITY ENGINEER.

Foster Place. . .	Foster Street .	Southerly . . .		Vitrified pipe . . .	8			1	79.50	
						7	14	681	11,474.38	$165,039.45
				Deduct for Binney Street Sewer, completed 1875. .					5,342.87	88,287.25
									6,131.51	$76,752.20

* Part of Binney Street Sewer. † Including Gate Chamber. ‡ Including dredging Broad Canal, and ballasting.

Low Land Filling.

The only low land filling has been the completion of the "Franklin Street District," at a total cost of $187,669.00. $131,167.29 was paid in previous years, leaving the cost this year $56,501.71, for which an appropriation was made of a like amount.

Bridges.

The West Boston and Craigie Bridges, in the charge of special commissioners, are in excellent condition. The Prison Point Bridge, now also in charge of commissioners, is, at the present time, in process of reconstruction, and not yet open to travel. The bridges over Broad Canal, at Third and Sixth Streets, are both in good condition. The Brookline Bridge needs new planking and a new draw-pier, otherwise is in good condition. The River Street Bridge is also in good order. The Western Avenue Bridge has just been repaired in a most thorough manner. The low-water girders and the braces, owing to the lateness of the season, have not yet been put on, but will be on the opening of the spring: a new draw will probably be needed soon. The Brighton Bridge has just been newly planked: the tops of the stringers are beginning to decay; but it is considered safe for another year. The bridges over the Fitchburg Railroad, at Walden Street and North Avenue, are in good condition as to safety for travel over them.

Water-Works.

The arrangements referred to in the last Report, concerning the taking of waters of Spy and Little Ponds, and Wellington Brook, as an additional supply, have been carried out. The conduit connecting Fresh and Little Ponds, and the thirty-six-inch main connecting Little and Spy Ponds, have been completed with the necessary gate-houses and appurtenances.

A large amount of work has been done towards improving the borders of Fresh and Little Ponds: large quantities of muck have been removed from Little Pond, and spread on the adjoining land, forming banks around the edge, thus increasing the depth, and, to a slight extent, the area, of the pond. A heavy storm coming just as the work was about completed, a considerable quantity of this material was carried back into the pond:

it has not entirely settled, but remains in suspension, and, together with a green vegetable growth which has appeared this summer, has rendered the water such, that it was deemed unwise to take the water directly through the conduit to Fresh Pond. A collecting-basin, or natural filter, is now in process of construction on the border of the pond near the gate-house.

The quality and probable source of this water are given in the report of the chemist accompanying the Report of the Water Board.

Surveys and plans have been prepared for diverting a portion of the water of Wellington Brook into Little Pond. The work at Fresh Pond has been the improvement of that part of the pond known as Black's Nook, by the removal of a portion of the muck and vegetable growth, grading the banks and adjoining grounds, and dressing the slopes with clean gravel, thus greatly improving what was before an unsightly spot; also the removal of a large amount of material from that part of the pond lying between the Hittinger Ice Houses, near the grove, and the Tudor Ice Houses, near Concord Avenue. The banks and grounds adjoining have been graded, the slopes paved with rubble slate-stone, and a gravel walk made at the top of the bank, with suitable provision to take the surface-water to the sewer. The old Engine House and other buildings have been torn down; a gate-house has been built over the screen-chamber; and the whole appearance of this portion of the pond has been greatly improved. An accurate survey of the ponds, showing the high and low water lines and topography of the lands contiguous, should be made at an early day, in view of prospective improvements for preserving the purity of the water.

Cemetery.

The various calls for laying out lots, levels for grading, and other measurements, have been met. The unfinished portion of the Cemetery has been surveyed, and a topographical plan made; the lines of avenues, paths, and lots, laid down, and grades established for them. The amount of land now unoccupied is very small: at best, it can last but a short time before an additional purchase must be made.

General Survey of the City.

This work has been continued as rapidly as the other demands upon the office would allow, no assistance being employed exclusively for this purpose. A large amount of the detail has been worked up; and the large map is fast approaching completion. Work on the sectional maps has been commenced, and they will be completed as soon as possible.

Office.

On assuming the duties of City Engineer in the latter part of March of this year, I found that all the instruments, both for field and office use, drawing-tables, and drawing-boards, were the property of the former City Engineer, J. G. Chase, Esq. Deeming it proper, as usual in larger cities, for the City to own the instruments for the use of the department, an appropriation was asked for and allowed for their purchase. This department has now in its possession, and owned by the City, two first-class transits fitted with modern improvements, a fifteen-inch Y, and a dumpy level: they were all manufactured by Messrs. Buff & Berger, have been in use for nearly a year, and have given good satisfaction. The whole appropriation of $1,000.00 was expended, and the office is now well supplied with office and field instruments. Seven assistants have been employed, five permanently. The original appropriation for the office was $8,000.00; additional, $1,000.00; total, $9,000.00. There has been expended, including the instruments, salary of the City Engineer, pay of assistants, horse-hire, car-fare, stationery, draughting materials, hardware, monuments and setting, stakes, &c., the sum of $7,986.63, leaving an unexpended balance of $1,013.37. The operations and management of this department for the first four months of the year ending Dec. 30, 1876, were in charge of J. G. Chase, Esq., at that time, and previously, your City Engineer.

I cheerfully acknowledge all favors received from him upon becoming his successor, and the various explanations given in detail of work in progress, as well as the detail of the management of the office. I would also acknowledge the valuable

aid rendered by all the assistants connected with this department, and the cheerful, prompt, and efficient manner in which my wishes and plans have been carried out.

Respectfully submitted.

WILLIAM S. BARBOUR,
City Engineer.

REPORT

OF THE

COMMISSIONER ON WEST BOSTON, CANAL, AND PRISON POINT BRIDGES.

THE Commissioner for West Boston, Canal, and Prison Point Bridges, submits for himself and associate his Sixth Annual Report of matters pertaining to the West Boston and Canal Bridges, and his First Annual Report on Prison Point Bridge.

West Boston Bridge.

The portion of the roadway between the draw and the abutment on the Boston side, upon which the wood pavement was allowed to remain last winter, was repaved with granite blocks in the latter part of April and first part of May. The curbstone was reset and the sidewalks repaved at the same time.

The roadway of the bridge for its whole length, with the exception of the space between the horse-railroad tracks, is now paved with granite blocks. In the space between the tracks, the wood will soon require replacing with granite; but, so long as it is in fair condition, it will be allowed to remain.

Some of the paving in the roadway and on the sidewalks on the solid filling at the Cambridge end was relaid at about the same time the work was done on the Boston end.

In August, several of the piles of the pier upon which the Superintendent's house is located were found to be broken, so as to be unsafe for supports to the house. The house was temporarily removed, new piles driven, and the pier thoroughly repaired.

This fall, the fences and engine-house have been painted; and the bridge is now in good order, and, unless in case of accident,

will require no outlay, except for running expenses, during the coming year.

Canal or Craigie's Bridge.

Mention was made in the last Annual Report of the probability of the extension to low water of the main sewer at the Cambridge end of this bridge; and the opinion was expressed, that it was feasible to extend the sewer outside of the lines of the bridge, and thus avoid interference with it. By the plan for the extension, as then proposed, the tearing-up of the bridge was unavoidable; but the present City Engineer of Cambridge (Mr. Barbour) has devised a plan by which an extension of the sewer can be built under the bridge without any injury to it; and the Commissioners hope, that, when the work is done, this or a similar plan will be adopted. Only the ordinary repairs have been made on this bridge during the year, and it is now in good condition.

No settlement has yet been made with Mr. Clark B. Woods for land taken, and damages claimed, for widening the bridge in 1874. The case is still in court.

Superintendent Smith of this bridge has, as last year, kept an account of the amount and kind of freight passing through the bridge during the year, which will be found appended.

Prison Point Bridge.

By an Act of the Legislature, approved May 26, 1869 (see Chap. 311, Acts and Resolves 1869), the draws in this bridge and in the West Boston and Canal Bridges were required to be rebuilt forthwith with a clear passageway for vessels forty-four feet in width. An Act approved June 1, 1870 (see Chap. 300, Acts and Resolves 1870), required a new draw, with a passageway for vessels thirty-eight feet in width, to be forthwith constructed; and it also provided for the appointment of Commissioners, — one by Cambridge, and one by Charlestown, — to have charge of the construction of the draw, and the care and management of it. This Act also provided that the expense of constructing and maintaining the draw, and other expenses pertaining to its care and management, should be borne equally by the cities. An Act approved June 23, 1870 (see Chap. 401,

Acts and Resolves 1870), reduced the width of draw-way required to thirty-six feet.

No action was taken by either of the cities interested until the present year.

In February, Messrs. Nash, Spaulding, & Co. sent a petition to the Harbor Commissioners, requesting the Board to order the draw-way widened, as required by the Acts of the Legislature. The Board voted that its Chairman inform the Mayors of Boston and Cambridge of the petition, and ask them to meet the Board on Wednesday, Feb. 23, in reference to the same. The Mayor of Cambridge and the Assistant City Solicitor of Boston appeared; and, as neither made any objections to making the required alterations, no order of the Board was issued, as it was agreed that the two cities should take the necessary steps, without delay, to comply with the Acts of the Legislature.

The Commissioner for Cambridge was appointed March 22; and the Commissioner for Boston, June 1. The Commissioners, soon after their appointment, requested their engineer, Mr. Henry M. Wightman, to prepare plans and estimates for rebuilding the draw. The plans were prepared, and submitted to the Harbor Commissioners for approval, which was received Sept. 20. As the requisite appropriations had been made by the two cities, the work was advertised as open for proposals from Oct. 5 to Oct. 12. Seven bids were received: the highest was $21,700.00, and the lowest $17,000.00. The contract was given to the lowest bidder, Mr. F. G. Whitcomb of Boston.

The bridge consists of little else than the draw; and, in order to rebuild that, it was necessary to renew the entire structure. The contractor is to rebuild the bridge with new oak pile foundations, and a hard pine superstructure, the flooring to be covered with a stone block pavement where practicable. He is also to build a new draw of the leaf pattern, but with iron instead of wooden main beams, and new draw piers on each side of the bridge.

The draw is about thirty feet nearer to the Cambridge side than before: the change of position brings the opening nearer to the alignement of the draw in the Eastern Railroad Bridge, and will greatly facilitate the passage of vessels.

The Commissioners expect the bridge will soon be completed,

the contractor having been now several weeks longer than the time in which he agreed to complete the work.

Appended to this Report is a statement of the payments made by the City of Cambridge on account of the bridges from Dec. 1, 1875, to Dec. 1, 1876, together with statements from the bridge superintendents of the number of times the draws were opened during the same time.

Respectfully submitted.

EZRA PARMENTER,
Commissioner for Cambridge.

CAMBRIDGE, December, 1876.

Number of times the draw in West Boston Bridge has been opened during the following months: —

December, 1875	103
January, 1876	13
February, "	8
March, "	43
April, "	97
May, "	225
June, "	171
July, "	247
August, "	249
September, "	296
October, "	429
November, "	193
Total for the year	2,074

CHARLES W. BLANEY, *Superintendent.*
JOHN McNULTY, *Engineer.*

Number of times the draw in Canal Bridge has been opened during the following months: —

December, 1875	37
January, 1876	50
February, "	32
March, "	48
April, "	322
May, "	374
Amount carried forward	863

Amount brought forward	863
June, 1876	386
July, "	404
August, "	348
September, "	212
October, "	264
November, "	192
Total for the year	2,669

A. W. SMITH, *Superintendent.*

Number of times the draw in Prison Point Bridge has been opened during the following months: —

December, 1875	27
January, 1876	6
February, "	3
March, "	4
April, "	27
May, "	55
June, "	66
July, "	40
August, "	85
September, "	29
October, "	45
November, "	40
Total for the year	427

NATHL. E. STORY, *Superintendent.*

Statement of the amount and kind of freight which passed through Canal Bridge during the year ending Dec. 31, 1876: —

Coal	145,771 tons.
Lumber	1,600,764 feet.
Wood	5,250 cords.
Stone	23,038 tons.
Lime	30,853 barrels.
Brick	48,043 M.
Gravel and Sand	133,099 tons.
Posts	8,900 pieces.
Piles	2,450 "
Slate	20 tons.
Drain Pipe	1,130 "
Powder	60 "
Hay	1,173 "

A. W. SMITH,
Superintendent.

The expenses of Cambridge for maintaining the West Boston, Canal, and Prison Point Bridges, during the year 1876, were as follows: —

Commissioner's Salary	$500 00
Engineering Expense	250 00
Salaries of Superintendents and Engineers	2,074 40
Repairs	1,767 89
Piles and driving for Pier	149 50
Lumber	201 48
Sea Wall	201 04
Gas, Repairs of Lanterns, &c.	961 01
Fuel	346 99
Paving	1,857 01
Painting Fences, &c.	137 25
Printing	19 72
Small Supplies	52 32
Pump for Engine	52 50
Watering Bridges	250 00
Water Rates	9 50
Harbor Commissioners for Compensation for displacement	32 05
	$8,862 66
Appropriation	$20,250 00
Expenses	8,862 66
Balance	$11,387 34

REPORT

OF THE

TRUSTEES OF THE DANA LIBRARY.

The Trustees of the Dana Library herewith submit to the City Council their Nineteenth Annual Report. The library year corresponds to the city's financial year; and the Report is brought down to the close of the month of November.

The Trustees are much gratified to find that the public appreciate the Library more and more, and its benefits and privileges are becoming very widely diffused throughout the city; for, above that of any other year, they have perceived numerous readers — from the extreme parts of the city (the farthest removed from the Library), and from a larger variety of the employments and professions of the community — resort to it for instruction and entertainment. It is pleasant also to notice an increased demand for that class of reading which is calculated to inform and enlighten; though there has been no perceptible diminution in the call for that which is fitted merely to amuse. In regard to the last-mentioned, our experience corresponds to that of many of the public libraries throughout the country; that is to say, about three-fourths of the books issued are works of fiction; and they are read for the purpose of passing time agreeably. And even this is a benefit to the readers; for, if they were not thus engaged, many would no doubt occupy their leisure time in recreation or employment far less innocent in its effects on their habits and morals.

There are those in the community who would gratify this taste to the full, and place within the public reach all works of fiction that were not immoral, even to the cheapest sensational production. This is justified on the ground, that, by such

means, a taste for reading would be created among a class of people who otherwise would not read at all; and this taste thus cultivated would develop into a demand for books of a higher character. In making our selections, we have endeavored to discriminate against merely sensational stories; and we believe that nothing has been placed upon our shelves that can strictly be called such. With our means we can find enough to gratify the taste for reading all ready to our hands, without venturing upon the experiment of providing for a lower one, in the hope of converting it by and by to a higher standard. We wish to see the Library in favor with all classes, not only the intelligent and the learned, but the humblest and poorest person in the city. Two qualifications only should be required, — orderly behavior in the rooms, and personal cleanliness. With these, all will be welcome, and all will receive like attention.

STATISTICS OF THE YEAR.

In 1875, the Library was closed for two months and a half for re-organization; and the Report for that year showed that the issues for nine months and a half amounted to 62,289. In this proportion, had the Library been open throughout the year, the issues would have been 75,264.

Number of Books given out in 1876: —

First Quarter	24,441
Second Quarter	22,494
Third Quarter	15,676
Fourth Quarter	19,701
Total for the year	82,312
Average per Day	269
Largest Issue for any Day (March 18)	631
Largest Issue for any Month (March)	8,671

The total for the year is very large, when the number of books constituting the Library is considered, it being more than ninefold. Our figures have been compared with those reported by five of the principal cities of Massachusetts, and found to be much the largest, with one exception, — the city of Lawrence;

and the Library of that city contains thousands of books more than the Dana. It can be claimed for this Library that its circulation is relatively greater than that of any other of which we have any knowledge, with the exception mentioned.

ACCESSIONS FOR 1876.

First Quarter	5
Second Quarter	160
Third Quarter	193
Fourth Quarter	427
Total	785

Of this number 47 were purchased from the income of Isaac Fay's legacy, 694 from the City's Appropriation, and 44 were donated as follows : —

Mr. S. H. Sanborn, 30 volumes ; State of Maine, 6 ; Dr. W. W. Wellington, 1 ; Dr. B. B. Appleton, 1 ; Mr. J. W. Cotton, 1 ; Mr. Arthur Hodgkins, 1 ; State of Massachusetts, 1 ; City of Cambridge, 1 ; Watertown Public Library, 1 ; The Cobden Club, 1.

Number of volumes belonging to the Library, 9,044.

During the year, 51 books have been replaced that were worn out, and 4 that were lost ; and the number covered amounts to 5,536.

Number of Subscribers for the year	1,756
Number of Subscribers since September, 1875	2,577
Number of Subscribers at present (total)	5,900

In the Reading Room, the number of visitors shows a slight advance over the previous year, being 9,865. This number would be largely increased, had we proper accommodation ; but our room is so small, that it is almost impossible for any one to find an opportunity for reading undisturbed.

RECEIPTS FOR THE YEAR.

Sale of Catalogues	$61 00
Fines	107 83
Sale of Waste Paper	2 60
Total	$171 43

All of which has been paid into the City Treasury.

Received from income of Isaac Fay's legacy, $60; it being one year's interest at six per cent. The fund, one thousand dollars, is invested in the city's note.

EXPENDITURES.

Salaries of Librarian, Assistant Librarian, Superintendent of Reading Room, Janitor, and Helpers in the Library Room	$2,065 26
Books, Magazines, and Newspapers	1,607 66
Rebinding and Repair of Books	348 30
Printing and Stationery	423 84
Rent and Taxes	838 20
Fuel, Gas, and Water-Rates	418 43
Bookcase, Furniture, Matting, &c.	206 68
Incidentals: Brooms, Expressage, Trifling Repairs, &c.	23 14
	$5,931 51
Amount of Appropriation	6,000 00
Balance unexpended	$38 49

The rooms occupied by the Library are inadequate for its business, and we trust that the appropriation for the coming year will be large enough to allow us to procure an addition to our premises. This can be conveniently obtained, had we the means to pay for it. The present quarters are so limited, that the work of the Library is frequently hindered and embarrassed by the numbers that are in attendance. It should be borne in mind that our funds are derived wholly from the city, except the income of the Fay legacy, which has amounted thus far to sixty dollars a year. Our only dependence is upon the liberality of the City Council. Last year we were allowed six thousand dollars. For the coming year we hope that an adequate sum will be appropriated, so that we may satisfy the constantly increasing demands upon the Library, without lessening our means for the purchase of books.

ISAAC BRADFORD,
GEORGE F. PIPER,
JOHN S. MARCH,
J. B. TAYLOR,
H. B. GOODWIN.

DECEMBER, 1876.

REPORT

OF THE

TRUSTEES OF THE DOWSE INSTITUTE.

To the Honorable City Council of Cambridge: —

The Board of Trustees of the Dowse Institute respectfully submits an attested copy of the Report of its Treasurer for the year 1875–76, which contains an exact account of the receipts and expenditures of the Board.

The course last season was given in Union Hall, and consisted of Lectures by Charles Bradlaugh, William Parsons, Henry Vincent, Robert Collyer, Wendell Phillips, Schuyler Colfax, W. H. Niles, H. G. Spaulding; of Readings by George Vandenhoff and J. Willoughby Reed; and of an Opera by the Redpath Opera Company.

Respectfully submitted.

JOHN C. DODGE,
ISAAC BRADFORD,
W. W. WELLINGTON,
W. A. BULLARD,
FRANK A. ALLEN,
} *Board of Trustees.*

Cambridge, Dec. 26, 1876.

REPORT

OF THE

TRUSTEES OF THE SANDERS TEMPERANCE FUND.

To the City Council: —

The Trustees of the Sanders Temperance Fund respectfully submit herewith their Twelfth Annual Report for the year ending Nov. 30, 1876.

The fund ($10,000.00) left as a legacy to the city by will of Charles Sanders remains invested, as heretofore, in notes of the city, bearing interest at six per cent, and producing an income of $600.00 ; which has all been paid to the missionary as salary.

In accordance with the requirements of the ordinance relating thereto, Alonzo Stewart was re-appointed as missionary in April last.

His Report, accompanying this, gives a statement of the details of his observations and work during the year.

ISAAC BRADFORD,
SAM'L L. MONTAGUE,
JOHN CLARY,
HENRY D. FORBES,

Trustees of the Sanders Temperance Fund.

Cambridge, Dec. 27, 1876.

REPORT

OF THE

SANDERS TEMPERANCE FUND MISSIONARY.

To the Trustees of the Sanders Temperance Fund.

Gentlemen, — Another year, with all its record of good and evil, has passed, since I rendered to you an account of my stewardship; and now, as then, the result is unsatisfactory to myself.

The good accomplished in rescuing the unfortunate inebriate from the power of the destroyer has been greatly disproportionate to the need. I have tried, with the limited means at my command, to meet the expectations of the founder of this mission. My time has been exclusively devoted to the work required by the conditions under which the bequest was made.

I have been at the Police Court at all its sessions, with the exception of two weeks' vacation in August (by permission); taken pledges, after personal inquiry into circumstances, of one hundred and fifty-six persons brought before the court for intoxication; have become responsible for the good conduct of some; have visited others at their homes, and with encouraging words tried to awaken the hope of brighter days; and very few of these have been arrested the second time. I have attended one hundred and sixty temperance meetings, in most of which I have advocated the cause; have visited the Jail and House of Correction more than sixty times, and distributed over 14,000 pages of temperance and religious reading to the prisoners and in reform club meetings.

By the Police Record, it will be seen that the arrests for intoxication during the year 1876 were 28 per cent less than during the previous year.

Through the blessing of our kind heavenly Father on the earnest, persistent efforts of the friends of temperance and humanity, the dark shadows which have rested upon so many households in our city (with all the attendant woes of want and sorrow) have, in many instances, been dispelled by the bright and cheering rays of the sun of temperance, bringing joy and plenty. May these efforts continue until the last vestige of intemperance shall have passed away, no more to return; and may the prayers and tears of innocent sufferers from the bitter curse of intemperance stimulate us to renewed efforts in this direction, until the Judge of all shall call us to account for our doings, and may we hear his voice saying, "Inasmuch as ye did it unto the least of these, ye did it unto me."

All which is respectfully submitted.

ALONZO STEWART,
Temperance Missionary.

DEC. 26, 1876.

REPORT

OF THE

MILK INSPECTOR.

To his Honor the Mayor and Aldermen of the City of Cambridge.

Gentlemen, — The undersigned most respectfully submits his Fourth Annual Report for the year ending Nov. 30, 1876.

The milk trade of the city of Cambridge is divided into three classes: First, wholesale dealers, selling from their wagons; second, retail dealers, selling from stores and shops; third, parties keeping cows, and selling to private families in their immediate neighborhood.

Number of Wholesale Dealers registered	57
Number of Wholesale Dealers now in business	50
Whole Number of Retail Dealers registered	237
Whole Number of Retail Dealers now in business	219
Persons keeping Cows registered	68
Number of Cows kept by those registered	107
Number of Samples of Milk analyzed	2
Number of Samples of Milk tested by Inspector	210
Largest Amount of added Water	19 per cent.

No Cases now pending in Court.

I have visited over a hundred places in the city where milk is publicly sold, and inspected one or more samples in each place.

I have also tested several samples of milk brought to the office for inspection, and in almost every case found the samples up to the standard required by law.

I have also, at the request of several citizens, made tests of milk left at their residences; and the results were generally satisfactory to the purchasers and consumers.

For more general information in relation to the adulterations of milk, and the ingredients used in said adulterations, I most respectfully refer to my previous Reports.

The following extracts from the law may be of interest to the citizens and dealers generally : —

Acts of 1864, Chapter 122.

SECT. 2. — The Inspectors shall keep an office and books for the purpose of recording the names and places of business of all persons engaged in the sale of milk within their limits. They may enter any place where milk is stored, or kept for sale, and all carriages used in the conveyance of milk ; and, whenever they have reason to believe any milk found there is adulterated, they shall take specimens thereof, and cause the same to be analyzed, or otherwise satisfactorily tested, the result of which they shall receive, and preserve as evidence ; and a certificate of such results, sworn to by the analyzer, shall be admissible in evidence in all prosecutions under this Act.

SECT. 4. — Whoever neglects to cause his name and place of business to be recorded in the Inspector's books, and his name legibly placed upon all carriages used by him in the conveyance of milk, before engaging in the sale thereof, shall forfeit twenty dollars for the first offence ; and, for a second and each subsequent offence, fifty dollars.

Act of 1872.

An Act to prevent the Sale or Exchange of Adulterated Milk.

Be it enacted, &c., as follows : —

SECT. 1. — Whoever sells or exchanges, or has in his possession with intent to sell or exchange, or offers for sale or exchange, adulterated milk, or milk to which water or any foreign substance has been added, shall, for the first offence, be punished by a fine of not less than twenty, nor more than one hundred, dollars ; and, for any subsequent offence, by a fine not less than fifty, nor more than three hundred, dollars.

SECT. 2. — Whoever sells or exchanges, or has in his possession with intent to sell or exchange, or offers for sale or exchange as pure milk, any milk from which the cream, or any

part thereof, has been removed, shall be liable to the penalties provided in the preceding section.

SECT. 3. — Whoever knowingly sells or exchanges, or has in his possession with intent to sell or exchange, or offers for sale or exchange, adulterated milk, or milk to which water or any foreign substance has been added, shall, for the first offence, be punished by a fine of not less than fifty, nor more than three hundred, dollars; and, for any subsequent offence, by a fine not less than a hundred dollars, and imprisonment in the House of Correction not less than thirty, nor more than ninety, days.

SECT. 6. — This Act shall take effect upon its passage.

Approved May 4, 1872.

Acts of 1863, Chapter 140.

SECT. 3. — It shall be the duty of the Inspector to cause the names and places of business of all persons convicted under the preceding section to be published in two newspapers printed in the town or county where the offence may have been committed.

All persons are respectfully requested to send to my office, to be tested, samples of milk purchased by them, if there is any doubt existing in their minds in regard to its quality; and are also requested to report to me any violation of any of the provisions of the above laws.

CITY PROPERTY IN THE INSPECTOR'S OFFICE.

One milk-jar, lactometer, and thermometer in case.

Respectfully submitted.

JOHN CAHILL,
Milk Inspector.

DECEMBER, 1876.

REPORT

OF

SEALER OF WEIGHTS AND MEASURES.

To his Honor the Mayor and Aldermen of the City of Cambridge.

Gentlemen, — The undersigned most respectfully submits his Fourth Annual Report for the year ending Nov. 30, 1876.

During the year I have tried, proved, adjusted, and sealed all scales, weights, measures, and milk-cans brought to the office, in accordance with Chapter 218, Section 3, of the Acts of the year 1870.

I have also visited several shops, stores, and places of business throughout the city, when requested by the owners thereof, and tried, sealed, adjusted, and proved all scales, weights, measures, and milk-cans found in said places.

I have also tried, proved, and adjusted all the public scales throughout the city; and the same are correct and in good condition.

In accordance with the Acts of this year relating to Weights and Measures, I have published in the "Cambridge Press" and "Cambridge Chronicle" a notice, calling upon all citizens using scales, weights, and measures, to bring the same to this office within sixty days, to be adjusted and sealed.

The law of this year (1876) relating to weights and measures is as follows: —

Chapter 123.

An Act relating to the Sealing of Weights and Measures.

Be it enacted, &c., as follows: —

Section 1. — The Sealers of Weights and Measures in the several cities and towns shall annually give public notice by advertisement, or by posting notice in one or more public

places in their respective cities and towns, to all inhabitants or persons having a usual place of business therein, who use scales, weights, measures, or milk-cans, for the purpose of selling any goods, wares, merchandise, or other commodities, or for public weighing, to bring in their scales, weights, measures, and milk-cans, to be adjusted and sealed, within sixty days after said notice. Such Sealers shall attend in one or more convenient place or places, and shall adjust, seal, and record all scales, weights, measures, and milk-cans so brought in.

In those cities or towns where a salary is paid to Sealers of Weights and Measures, no fees shall be charged for such services. In other cities and towns, the said Sealers shall receive the compensation set forth in Section 14 of Chapter 51 of the General Statutes.

SECT. 2. — After the expiration of the said sixty days, the said Sealers of Weights and Measures shall go to the houses, stores, and shops of persons mentioned in the foregoing section, who have neglected to comply with the notice given thereunder ; and, having entered the same with the assent of the occupants thereof, shall adjust and seal their scales, weights, measures, and milk-cans, and shall be entitled to receive for said service the compensation set forth in said Section 14.

SECT. 3. — The said Sealers of Weights and Measures shall go once a year, and oftener if necessary, to every hay and coal scale, dormant or other platform balance, within their respective cities and towns, that cannot be easily or conveniently removed, and test the accuracy of, and adjust and seal, the same ; and shall receive therefor the compensation set forth in Section 14.

SECT. 4. — All persons using any scales, weights, measures, or milk-cans, for the purpose of buying or selling any commodity, may have the same tested and sealed by the Sealers of Weights and Measures, at the office of any of said Sealers, whenever such persons desire to have it done.

SECT. 5. — Whenever a complaint is made to a Sealer of Weights and Measures by any person, that he has reasonable cause to believe, or whenever a Sealer of Weights and Measures shall himself have reasonable cause to believe, that any scale, weight, measure, or milk-can, used in the sale of any commodity within the city or town, is incorrect, the said Sealer shall go to

the place where such scale, weight, measure, or milk-can is, and test and mark the same according to the result of the test applied thereto; and if the same be incorrect, and cannot be adjusted, the said Sealer shall attach a notice thereto, certifying the fact, and forbidding the use thereof until the same has been made to conform to the authorized standard. Any person using any scales, weights, measures, or milk-cans, after a Sealer of Weights and Measures has demanded to test the same, and has been refused such permission, shall be liable to a penalty of not less than ten nor more than one hundred dollars.

SECT. 6. — All scales, weights, measures, and milk-cans that cannot be made to conform to the standard shall be stamped "condemned" or "C. D." by the Sealer of Weights and Measures; and no person shall thereafter use the same for weighing or measuring any commodity sold or exchanged, under the penalties provided in the case of the use of false weights and measures.

SECT. 7. — If any person shall knowingly use any false weight measure, milk-can, scale, balance, or beam, or shall alter any weight, measure, milk-can, scale, balance, or beam, after the same shall have been adjusted and sealed, so that the same thereby shall not conform to the public standard, and shall fraudulently make use of the same, he shall forfeit for each offence the sum of fifty dollars, — one-half to the use of the city or town, and one-half to the use of the complainant. And any Sealer, when he shall have reasonable cause to believe that any weight, measure, milk-can, scale, balance, or beam, has been altered since the same was last adjusted and sealed, is authorized and required to enter the premises in which such weight, measure, milk-can, scale, balance, or beam, is kept or used, and examine the same.

SECT. 8. — The City Council of any city may by ordinance, and any town may by law, provide that the Sealers of Weights and Measures for their respective city or town be paid by a salary, and that they account for and pay into the treasury of the city or town the fees received by them by virtue of their office.

SECT. 9. — The mayor and aldermen of any city are authorized to remove any Sealer of Weights and Measures in said city at any time they may see fit.

SECT. 10. — Chapter two hundred and eighteen of the Acts of the year eighteen hundred and seventy is hereby repealed.

SECT. 11. — This Act shall take effect upon its passage.

Approved April 6, 1876.

SCHEDULE OF CITY PROPERTY CONTAINED IN THE SEALER'S OFFICE.

One Set Avoirdupois Weights.
One Balance in cabinet.
One Set Standard Dry Measures.
One Set Standard Wine Measures.
Standard Yard-stick (brass).
Standard Yard-stick (wood).
Pair Try Scales in case.
Forty fifty-pound Weights (iron).
One Drill Stock and Drills.
One Hammer.
One Mallet.
One Vise.
One Wrench.
One Knife.
Three Screw-drivers.
One brass Yard-stick.
One Set Avoirdupois Weights in case.
One Set Dry Measures (copper).
One Set Wine Measures (copper).
One Pair Nippers.
One Pair Cut Nippers.
One Brand, Letter C.
One Brand, double C.
Three Stamps, C.
Three Cases.
Four Files.
One Punch.
Quarter Bushel Flax-seed.
Small quantity Shot.
One Charcoal Basket Measure.

Respectfully submitted.

JOHN CAHILL,
Sealer of Weights and Measures.

DECEMBER, 1876.

REPORT

OF THE

CAMBRIDGE WATER BOARD.

To the City Council of the City of Cambridge:—

In compliance with City Ordinance and our custom, the Cambridge Water Board herewith submits to you its Twelfth Annual Report.

Total Cost of the Water Works.

Net Cost of the Water-Works, Nov. 30, 1875, as per last year's Report	$1,552,567 20
Expended for Extension Account for the year ending Nov. 30, 1876	104,143 11
Making the Total Cost, Nov. 30, 1876	$1,656,710 31

Net Cost of the Water Works.

Amount representing the Total Cost of the Works as above stated	$1,656,710 31
Less the Amount of Water Debt paid from the Sinking-Fund to June 30, 1876	186,100 00
Leaving Amount of Water Debt unpaid	$1,470,610 31
Deduct from this the Amount of the Sinking-Fund on hand June 30, 1876	179,441 33
And we have the Balance, showing nearly the Net Cost of the Water-Works	$1,291,168 98

Statement showing in brief the entire transactions on account of the Water-Works for the year ending Nov. 30, 1876.

Received.

Appropriation for Extension Account	$110,000 00
From Water-Rates	179,166 76
From Supply Account and shutting off and letting on Water	8,645 52
From Rent of House	150 00
Interest on Sinking-Fund to June 30, 1876	7,570 45
Interest accrued on Bonds sold	1,166 67
	$306,699 40

Expended.

Extension Account	$104,143 11
Care and Repair	28,586 65
Supply Account	7,071 52
Interest on Water Debt	83,730 00
Unexpended Appropriation	5,856 89
Balance showing Gain in 1876	77,311 23
	$306,699 40

Comparative Receipts.

Water-Rates for the year ending Nov. 30, 1876	$179,166 76
Water-Rates for the year ending Nov. 30, 1875	138,880 37
Showing Increase for the year 1876	$40,286 39

Included in this increase is $17,132.77, which we have received this year from the city for water which was furnished in previous years.

In reference to the foregoing statements of our doings the past year, we think it proper to state, that of the $104,143.11 which was spent, and charged to "Extension Account," more than one-half was expended in accordance with the votes of

the City Council last winter, by which the Water Board, in consultation with the City Engineer, was authorized to expend $26,000.00 to the best possible advantage in improving the several sources of our water-supply, *for the purpose of providing work for the destitute laboring-men*, at the uniform price of one dollar per day. As all this $26,000.00 by the terms of the order must be paid directly to the men, we could take no part of it for any other purpose ; and we were thereby compelled to pay for all pumping, pipes, tools, overseers, and all other incidental expenses, from our regular appropriation for Extension Account : this amounted to about $28,000.00. The work was done under some disadvantages, on account of the haste with which it was decided upon, the season of the year, and the manner of doing the work. We spent the money as you directed, and as set forth in the order. We had so many applications for work, that we were obliged to restrict the men employed to those who would bring to us a certificate, from the Overseers of the Poor, that they were entitled to receive assistance from the city. Under this plan, we continued paying the men every day in one dollar bills ; and we have on file the names of the men to whom this $26,000.00 was thus paid. We think there can be no doubt that this money did a great amount of good among the poor people of Cambridge last winter.

At the time the city bought the Water-works there was a great difference of opinion among our citizens, whether it would ever pay. Some thought they would be a constant bill of expense to the city ; while others thought differently. To be able to decide the question in the future, the then Mayor, now a member of this Board, interested himself to have the accounts of the Water-works kept separately ; and, as the net profits of the works from year to year were passed to the sinking-fund of the Water-works, this was easily done.

We notice a change has been made by the City Council during the past year in the manner of making up the sinking-fund of the Water-works, by which a specified sum is passed to the fund annually, instead of the profits of the works, as heretofore. By so doing, the net cost of the Water-works will not hereafter appear by deducting the amount of the sinking-fund from the water-debt.

enters Fresh Pond: a large amount of muck and vegetable deposit was removed from this place. The banks around have been shaped up, and, to some extent, gravel dressing has been put around the borders; so that it presents now to the passer-by a comparatively clean and tidy place, instead of the very objectionable slough-hole it was before.

Third, A new thirty-inch conduit has been laid between Little and Spy Ponds, with suitable gate-house and other connections, thus giving us the control of all the water-supply to which we are entitled under our charter. This is so arranged, that we can fill up Spy Pond from Wellington Brook and Little Pond, or draw from it to re-enforce Fresh Pond, as our condition may require.

Fourth, Under the direction of Mr. Chase, our former City Engineer, a large amount of work was done to clean out and improve Little Pond. A strip of land five rods wide, around portions of the pond where it was needed, was taken, and cleared of the trees and brush thereon. Arrangements were then made, and the water in the pond pumped out, so as to expose the bottom in the shallow parts of the pond. The part exposed was soon frozen, so that it could be worked upon. A large force of men was then put at work, cutting and wheeling out the boggy material in the bottom, which was deposited on the surrounding shore. This plan was followed until two or three layers, in some places, had been taken out. The plan of working was a complete success; and a very large amount of objectionable material was removed from the pond.

Our experience proved that sufficient means had not been provided to keep the material on the shore after we got it there. A large part of what was taken out was frozen when it was piled on the shore. Soon after, and before the frost came out, and the banks had time to settle, a flood came, and raised the water high in the pond against the banks that had been formed. This took the frost out of the lumps of muck; and a considerable portion of the bank melted like snow, and ran back into the pond again: still a part of what we took out remained on the shore, and some improvement has been made in the pond.

We think our experience shows that there is no way to retain the banks in the soft lands which border some parts of

the pond, except by driving a row of sheet-piling to hold the pressure, and keep the water from washing the banks down.

It may be remembered that last year, as compared with the year before, showed a falling-off, in our receipts, of $14,753.90. We gave what then seemed to be satisfactory reasons for this decrease. During the past season, we have discovered that there was still another reason beside those named, which was found in the unfaithfulness and dishonesty of A. F. Fifield, our late Registrar.

The Auditing Committee of 1875, Messrs. Carter and Slocomb, had not completed their work when the city documents went to the printer, and therefore there was no report from that Committee of this Board made last year. The Committee could not make the accounts of the Registrar agree, and they became suspicious that they were not right. The explanations of the Registrar were not satisfactory; and they determined to push their investigations until they were satisfied. They pursued their work faithfully, devoting several weeks of personal attention to the examination of the books and accounts. This involved going several times over more than six thousand different accounts. As a result, they became satisfied of the Registrar's incompetency, and found good grounds to distrust his honesty.

At this stage, the matter was reported to the Board; and it was evident that only by a long and thorough examination of our books by an expert could we ascertain the true state of affairs in this department. It was determined to make the work thorough; and for this purpose a special committee of three, composed of Messrs. Merrill, Bradford, and Allen, was appointed, with full powers.

The Committee employed Mr. J. A. Holmes as an expert, with such other assistance as was needed to help him. It was not long before this Committee became satisfied that the Registrar was both incompetent and dishonest. Up to this time, the Registrar had stoutly maintained, that, while there might be errors in his accounts that could be rectified, every thing was honest on his part. The Committee, acting on the evidence they had, recommended the Board to discharge him; which was done at once. The next morning he fled from justice, thus fully confirming the views of both Committees in regard to him. It is a sad duty thus to report the fall of one who was a general

favorite, and who had many qualities that peculiarly fitted him for the office he held.

The Committee prosecuted their labors through several months, making a careful examination of our books and accounts for several years past; and the result leaves no doubt that our late Registrar is a defaulter to a large amount, which he has taken from time to time, extending over several years. We shall submit to the City Council copies of the Report of the Special Committee, with the results of their examination, which will furnish you with all that we know about this matter up to that time. The investigation is still going on; and, when completed, a full report will be made.

The city holds the bond of the late Registrar in the sum of five thousand dollars, with the Registrar's father and Mr. Israel Tibbetts as sureties.

General Remarks.

Almost every year, for the past few years, there have been stories circulating through the community, calling in question the purity of our water, and its fitness for domestic use.

We need hardly say that a matter so intimately connected with the comfort and health of our citizens has not failed to receive from us careful attention. The principal reasons for any dissatisfaction that may exist we think may be found, *First*, In the use of Fresh Pond for boating, by which more or less persons have been drowned, and in some cases the bodies have been in the pond several days before they were recovered; *Second*, The surface-drainage that finds its way into Fresh Pond from the dwellings and lands around the pond, and which is constantly increasing as the surrounding country becomes settled; *Third*, The character of the land and surroundings of the country, the water-shed of which supplies Wellington Brook, and Little and Spy Ponds, our new sources of water-supply.

We are glad to know that application has been made to the legislature for authority for the city of Cambridge to remedy the *first* reason above named; and we cannot doubt, that, if the matter is properly presented, the right will be granted to forbid any boating in the future.

In regard to the *second* ground of complaint, we can only say

that there are undoubtedly some places where the drainage from various sources finds its way indirectly into Fresh Pond, more particularly in times of heavy rains, and during the spring freshets caused by the melting snow. We have called the attention of the City Council to this in several of our Annual Reports; but, as the City Council changes from year to year, we think what we have said in regard to this matter has been lost sight of, and the whole subject is brought up, and treated as if it was a new thing, which has been overlooked or neglected by us. It has been the policy of the Board to do those things first which seemed the most important, expecting to do all that was necessary as the works progressed, and the required appropriations were made. A careful analysis of the water from time to time has failed to show any change in the quality of the water in Fresh Pond, and no practical evil has thus far resulted from what drainage has found its way into the water we use.

We are satisfied, that while the evil of surface-drainage can be wholly removed only by a sewer around the pond, yet, at a small expense, a large part of the drainage into the pond can be so arranged as to be filtered through a gravel-bank before it finds its way into the pond, thus removing all substances held in suspense, and greatly mitigating, if not wholly removing, the evil.

In regard to the *third* (ground of fear we shall call it), we had a careful analysis made of all the waters reached by our new conduit, in June, 1875; and the result showed that the average quality of Spy and Little Ponds, and Wellington Brook, was better than Fresh Pond at the same date; and thereupon we proceeded to secure these waters as soon as we could. All analyses made since have confirmed the purity of these waters.

We now present to you extracts from our former Annual Reports, to which we have already referred, showing what we recommended to be done to improve and protect the

Purity of the Water.

1872. "In closing our Report, we wish to refer to a matter that does not come under our especial charge, a plan by which we think the condition of the pond might be greatly improved: we mean the construction of a road around the border of our beautiful lake.

"There is a constantly-increasing demand upon us to provide for the drainage from the estates bordering on the pond, which now pollutes the water. The construction of a sewer in connection with such a road would carry all the drainage into Alewife Brook, below the outlet of the pond. This, with the cleaning-up of the banks between such a road and the borders of the pond, would do much towards keeping the water clean and pure.

"The parties who own the land abutting on the pond are largely engaged in cutting and storing ice; and it is for their interest to increase the purity of the water and the area of the pond by clearing out the vegetable matter therein. We have reason to believe they would join in this great improvement. The greatly enhanced value of the four or five hundred acres of land that would thus be rendered a most attractive locality for building-purposes would make it an object alike for the city and the town of Belmont, and the land-owners, to spend the money required for this purpose, aside from the benefit it would be to our natural reservoir."

1873. "We were gratified at the prompt action of the City Council in voting to put in a sewer in Concord Avenue and Vassal Lane, by which a large amount of surface-drainage on the easterly side of the pond can be kept out of the pond, and carried below the outlet into Alewife Brook, while at the same time we can properly drain the new pumping works that have been erected. The subject of protecting our water-supply from drainage around the pond is an all-important one, and appeals to the personal interest of every one who uses the water.

"The sewer already voted in will undoubtedly, in the end, be part of a continuous one reaching entirely around the pond. As the borders of the pond become more thickly settled, the necessity of this course will present itself more and more."

1874. Among the things enumerated in its Annual Report, which the Board thought necessary to do, we find recommended, "The ultimate extension of the sewer, already commenced, entirely around the pond, so as to cut off all filthy drainage into the pond. This kind of drainage is constantly

increasing, as the region around becomes more settled, and will soon demand serious attention."

1875. "To clean out that part of the pond known as 'Black's Nook,' where our new conduit enters the pond. Undoubtedly other things will be found necessary to improve the purity of our water, and increase our resources."

It will thus be seen that the subject of the "Purity of our Water" has not escaped our attention. We have not had any evidence presented to us to show that the drainage into the pond has had any appreciable effect upon our water, thus far. Our pond at high water contains from 1,200,000,000 to 1,500,-000,000 gallons of water, an amount nearly equal to two years' supply. It will be seen that whatever comes into the pond in the form of drainage becomes diluted in this vast body of water, in addition to half as much more which finds its way into the pond from various sources every year. In order that you may see the past and present condition of our water in respect to purity, and that we have not been remiss in applying the best chemical tests to prove its quality, from time to time, we give you herewith a table showing analysis of all the waters that come into our water-supply. You will notice that we have no analysis reported from 1853 to 1872, a term of nineteen years, in which time, so far as we know, the question of the purity of the water was not raised.

In connection, we give you a table of the analysis of the water from eight different wells in our city, and some from other towns around, also of the Cochituate and Mystic waters. By comparison, you will see, that, while our water is not as pure as some other water-supplies, it is *very greatly* superior to any of the well-waters; and it will also be noted that most of the analysis of Cambridge wells was made many years ago, before the soil was so much impregnated with drainage as now.

ANALYSIS OF CAMBRIDGE WATERS.

Water From.	Chemist.	Date.	Results in 100,000 Parts.					
			Inorganic Matter.	Organic Matter.	Total.	Free Ammonia.	Albuminoid Ammonia.	Total.
Fresh Pond	Mariner . .	July, 1853.	8.51	2.31	10.82			
"	Sharples .	Oct., 1872.	16.49	5.00	21.49			
"	Horsford .	—— 1873.	9.72	4.05	13.77			
"	Sharples .	Feb. 22, 1875.	8.00	5.00	13.00	.0170	.0155	.0325
"	" . .	Mar. 12, 1875.	9.00	4.00	13.00			
"	" . .	June 2, 1875.	11.00	3.00	14.00	.0050	.0060	.0110
"	" . .	June 16, 1875.	9.50	3.00	12.50	.0050	.0060	.0110
"	" . .	Mar. 9, 1876.	10.00	4.20	14.20	.0048	.0080	.0128
Average of eight analyses.			10.25	3.82	14.07	.0079	.0089	.0168
Spy Pond	Horsford .	—— 1870.	9.60	6.40	16.00			
"	Sharples .	Feb. 22, 1875.	12.00	5.00	17.00	.0124	.0217	.0341
"	" . .	June 2, 1875.	11.70	3.00	14.70			
Little Pond	" . .	June 2, 1875.	8.70	4.50	13.20	.0016	.0110	.0126
" "	" . .	Mar. 13, 1876.	13.40	6.60	20.00	.0128	.0120	.0248
Spring	" . .	" "	13.20	6.80	20.00	.0088	.0080	.0168
Pump	" . .	" "	18.60	4.50	22.50	.0064	.0064	.0128
Wellington Brook.	" . .	June 16, 1875.	7.50	3.00	10.50	.0020	.0090	.0110
Alewife Brook. . .	" . .	June 16, 1875.	9.50	4.50	14.00	.0050	.0120	.0170

ANALYSIS OF VARIOUS WATERS.

Location.	Chemist.	Date.	Results in 100,000 Parts.					
			Inorganic Matter.	Organic Matter.	Total.	Free Ammonia.	Albuminoid Ammonia.	Total.
Richardson's Well, Dana Hill,	Mariner.	Dec. 1853.	19.90	6.60	26.50			
Sawyer's Well, Main & Pl'sant,	"	"	23.70	7.50	31.20			
Warren's Well, Dana Hill,	"	"	23.10	5.20	28.20			
Pump Water, Main & Norfolk,	"	"	46.50	19.30	65.80			
Richardson's Well, Dana Hill,	"	"	42.90	15.60	58.50			
Fresh Pond Meadows,	Horsford.	Dec. 1870.	22.40	9.60	32.00			
Well, Cottage Street, North Cambridge,	Sharples.		16.42	8.75	25.17			
Well, Craigie St., Cambridge,	"	1873.	20.58	35.24	55.82			
Well in Cambridge,	"	"	7.85	17.83	25.68			
Well, Crosby St., Arlington,	"	1875.	22.00	14.50	36.50			
Well in Charlestown,	"	"	14.00	60.00	74.00	.0248	.0279	.0527
Well in Chelsea,	"	"	15.00	24.00	39.00			
Well in Brookline,	"	1876.	13.58	47.06	60.64	.2309	.1058	.3367
Well in Jamaica Plain,	"	1873.	41.51	38.48	79.99			
Cochituate,	Jackson.	1854.	2.59	1.84	4.43			
"	Nichols.	1870.	3.08	1.12	4.20			
"	Hayes.	1871.	4.06	1.42	5.48			
"	Sharples.	1872.	2.01	2.78	4.79			
"	"	1873.	2.10	2.40	4.50			
"	"	1875.	4.00	1.50	5.50			

We also give you, by some references to our past Reports, the evidence that we have also given attention to our prospective wants in an

Additional Water-Supply.

There was a general belief, in the early history of our water-works, that Fresh Pond would furnish an unlimited supply of water. The great droughts of 1872 and 1873 dispelled this illusion, when, for a considerable time, the amount we pumped out of the pond daily lowered the pond by just about the same amount of water as measured by its area.

Another prevailing opinion was shown to be without any foundation; to wit, that there was an underground connection between Fresh Pond and Little and Spy Ponds, as the constant lowering of Fresh Pond had no appreciable effect on the other ponds. With these facts before it, the Board foresaw, that, at some not very distant day, our rapidly-growing city would need a larger water-supply; and we find in the Report for 1872 a recommendation "that application be made to the legislature, that we be permitted to take the water from such streams in this county (the right to which is not already granted others) as we can bring to advantage to re-enforce our present water-supply."

No notice having been taken of this recommendation, so far as we could learn, the same recommendation was repeated in the Water-Board Report of 1873. A hearing was secured for us before the proper committee of the legislature; but Watertown and Belmont opposed our taking Clematis Brook to re-enforce our supply, when, in 1874, the Board recommended that "application be made to the legislature for the right to take water from such streams as can conveniently be brought to re-enforce our present water-supply, when by so doing we shall not interfere with any rights already granted to others."

We recommend the following things which need to be done, and we present them in the order of their importance as presented to our minds, and for them in due time we shall ask from you the necessary appropriations, in addition to the amount for extending the street pipes.

First, Secure a strip of land around Fresh Pond of sufficient width to enable us to preserve the purity of the water in the

pond ; and we think that the land needed for this purpose can be properly ascertained only by a careful topographical survey of the land around the pond.

Second, Provide a basin which will receive nearly all the surface-drainage now coming into the pond, and from which the drainage-water can find its way into the pond, only after being filtered through a bed of gravel. This we think can be done at a very moderate cost, after securing the necessary land.

Third, Drive sheet piling around the low borders of Little Pond to hold the bank, and enable us to prevent the drainage from the surrounding low lands from running into the pond.

As our city is growing rapidly, and every year is calling for more water, we think it is wise for us to do what we can to anticipate our future wants ; and we recommend that suitable action in proper season be taken next fall to petition the legislature for the right to take such water as we can get conveniently to re-enforce our water-supply.

Since writing the foregoing, we have had made by request of the joint Committee of the City Council appointed to confer with the Water Board in regard to the purity of our water, and other matters pertaining to the water-works, an analysis of all the different waters connected with our water-supply ; and we herewith send to you a copy of the report made of the analysis of the waters by S. P. Sharples, Esq., chemist, and State assayer. Much valuable information is given therein in regard to our water-supply and other matters of interest in connection therewith ; and we think this document should be published with our Report, for the information of the people, and for future reference.

We make therefrom the following brief extracts, to which we would call especial attention : —

" It will be seen from the analysis, that, while the water supplied to Cambridge is much harder than most of the waters quoted, in point of purity, and freedom from sewage-matter, it compares favorably with the best of them ; being fully equal, in this respect, to Cochituate when delivered from our hydrants.

" I would therefore recommend that the supply from Wellington Brook and the filter-basin at Little Pond be utilized at once."

It gives us pleasure to testify to the valuable services of W. S. Barbour, our City Engineer, who has taken a great interest in all our work, and rendered to us cheerful and valuable assistance.

For any further details that may be required in regard to the condition of our Works, we would refer to the Reports of the Registrar and Superintendent made to this Board, which we herewith submit as part of our Report.

GEO. P. CARTER,
J. WARREN MERRILL,
H. L. EUSTIS,
C. W. KINGSLEY,
F. A. ALLEN.

REPORT

ON

POLLUTION OF WATER-SUPPLY.

The Joint Special Committee of the City Council appointed to confer with the Water Board as to the sources of pollution to our water-supply, and the means of preventing the same, have attended to their duty, and respectfully report.

A meeting was arranged with the Water Board, when the object of the Committee was presented, and such information as the Board could furnish was requested.

A detailed statement of what the Board had done to ascertain the purity of the water from time to time, since the city bought the works, was presented, with tables showing the analysis of the water at the time it was taken for the use of the city, and at various times since, down to a recent date. All these analyses show that the water of Fresh Pond has nearly maintained its original standard, as per Mr. Sharples's Table No. II., attached to this Report. This table also shows that our new sources of supply — viz., Little and Spy Ponds, and Wellington Brook — are, taken together, as pure as Fresh Pond. In answer to our inquiries, the Water Board informed us that there were some places where, at certain times of the year, drainage might find its way into the pond, and referred us to their Reports of previous years to the City Council, wherein they claimed they had fully presented the matter, and suggested the remedy.

Being anxious to obtain all possible information, your Committee made a personal inspection of the borders of Fresh Pond, also of the connection made with Little and Spy Ponds and Wellington Brook, and their surroundings, which was as thorough as the season would admit. The only places from which

your Committee think that there is immediate danger to Fresh Pond are on the south-westerly side, near Cushing Street, where more or less drainage, at certain seasons of the year, finds its way into the pond, and should be cared for at once ; also from the drainage which may find its way into the pond from Fresh Pond Hotel, and the picnic-grounds and the boating connected therewith. The Mayor has already taken the proper steps to bring a petition before the legislature for authority to prevent boating on the pond, which, if successful, will remove one great cause of complaint. In regard to the picnic and hotel grounds, your Committee would recommend, that so much of the land bordering on the pond as is connected with these premises be immediately taken under the authority given us by the legislature, and that the same be properly fenced, so as effectually to exclude all persons from the pond in that locality. Our inspection of Little Pond satisfies us that the chance of any deleterious matter finding its way into the pond is very small. In regard to Wellington Brook, there are some houses in Belmont, whose drainage, if any, would naturally find its way into the brook. In one place there are also a number of pig-pens, from which, in heavy rains or melting snows, surface-drainage finds its way into the brook. The analysis shows that the amount of pollution which finds its way into the brook from this source is more imaginary than real: still we think that arrangements should be made with the owners, either to remove the pens entirely, or, if that cannot be done, to change their location, so that all the wash or surface-drainage would run southerly, and away from the brook; and that a tight cement cistern be built to catch and hold the drainage.

We did not make an inspection of the borders of Spy Pond, as we were informed by the Water Board that they were not taking water from the pond, and did not intend to do so (except in an emergency), until they had made a careful examination and analysis of the water at different seasons of the year, as recommended by Mr. Sharples. After making this personal inspection, we arranged for another meeting, to which we invited the gentlemen who had appeared before the Board of Aldermen when this matter was before that Board, together with the Water Board, to meet us, and give their views in regard

to what should be done. Our attention was called to the drainage which finds its way into our water-supply, as herein referred to; and also to the character of the land which forms the water-shed, from which a large part of the water comes to make up Wellington Brook and Spy and Little Ponds. No plan was presented or recommended to remedy the evils complained of; but it was thought by some of the gentlemen, that a commission should be employed, consisting of an engineer, a chemist, and a sanitarian, to examine the whole subject of the quality and quantity of our water-supply.

The extent of our supply, and the quality of our water, were discussed by the members of the Water Board; and, so far as possible, the subject was considered in all its bearings. This has satisfied your Committee that an expenditure of money in this direction is not called for at present. If we were seeking a *new* supply, the quality and quantity of which were unknown, then a commission, as suggested, would be desirable; but from the fact that the Water Board is aware of the sources of pollution that exist, and that it now has, and has had for years, the services of as competent an engineer and chemist as would probably be on a commission, we think, that, if the appropriations asked for are made by the City Council, our water-supply will be protected just as well as through the recommendations of a paid commission.

To satisfy ourselves in regard to the present condition of the waters, we decided to have a thorough analysis made of all the water we command; and herewith we submit the Report of S. P. Sharples, Esq., chemist, which presents the matter of the quality of the water in a most favorable light, both on its own merits, and in comparison with other water-supplies. To this Report, with the tables annexed, we invite your careful attention. This Report seems conclusive evidence to your Committee, that most of the danger apprehended, that our water will be contaminated by the drainage from cultivated lands (which largely compose the water-shed), has no foundation in fact. We think Mr. Sharples's statement in his Report — "that Nature understands her business, and, if we only give her time enough, will take care of all noxious organic matters in water" — is a fact acknowledged by all chemists, and should be taken as such, until science disproves the same.

Perhaps it is a misfortune that our water-supply is too near home, and is subject to the personal observation of our citizens from day to day. This is probably the reason we hear complaints. Persons see and report what in itself is impure, not thinking of the process of purification that takes place before the water they see is used.

It is the opinion of this Committee, after a careful comparison of our own supply with others with which we are acquainted, that Fresh and Little Ponds, and Wellington Brook, are as favorably situated, as regards their liability to contamination, as any other supply that can be named, as we have no large manufactories pouring their drainage and refuse matter into our water, nor are they surrounded by large barn-yards, and other out-buildings usually to be found surrounding ponds and streams farther away from the city. In this connection, it is proper to state, that while several physicians of Cambridge appeared before our Committee, yet no complaint was made to us in regard to the water being unwholesome, or in any way injurious to the public health; and this point is fully covered, we think, by Mr. Sharples in his Report. On page 13 he says, "It will be seen from these analyses, that, while the water supplied to Cambridge is much harder than most of the waters quoted, in point of purity, and freedom from sewage-matter, it compares favorably with the best of them; being fully equal, in this respect, to Cochituate when delivered from our hydrants."

Fresh Pond is really our reservoir or settling-basin, and should be protected from the constantly increasing drainage on the shores. While no perceptible evil has yet come from this source, yet it is wisdom to provide for the future, and see that the pond is properly protected. To do this, we must control the borders of the pond, and, if possible, the pond itself. And we would therefore recommend that *immediate* action be taken, under the authority that we already possess, to control that portion of the borders connected with the hotel and picnic-grounds, and on the south-westerly side, near Cushing Street, as previously mentioned in this Report; and that after a careful survey has been made, and a system of sewerage adopted for this whole territory, then whatever land is shown by the survey to be necessary for the full protection of the pond, and for ulti-

mately building a sewer entirely around it, be taken for that purpose. It seems to us that any action in taking or purchasing land until this is done would be in the dark.

In conclusion, your Committee feel that this whole subject of our water-supply and its protection is in competent hands, and can be safely left there, provided the City Council make the appropriations necessary to carry out their recommendations. The Water Board is composed of gentlemen who have for years made this subject their study, and seem to understand the whole subject. They are personally interested, in their official capacity, that every thing should be done to keep their department up to a high standard, and, as citizens and tax-payers, that all appropriations asked for should be economically and judiciously expended.

All which is respectfully submitted.

SAM'L L. MONTAGUE,
GEO. H. HOWARD,
PEREZ G. PORTER,
GEO. F. WHITING,
ARCHIBALD M. HOWE.

REPORT

ON THE

WATER-SUPPLY OF CAMBRIDGE.

CAMBRIDGE, Dec. 18, 1876.

TO THE JOINT SPECIAL COMMITTEE OF THE CITY COUNCIL OF THE CITY OF CAMBRIDGE.

Gentlemen, — Having at your request visited the designated localities, I herewith transmit a report on the quality of the water analyzed.

Samples of water have been collected from the following localities: —

No. 1. From the surface of Fresh Pond, directly under the ice, which was about an inch thick. This sample was slightly milky, evidently from suspended clay. It will be recollected that the pond was not frozen over until Sunday, and that Saturday we had a violent gale from the north-west: this had the effect of stirring up the water somewhat, and it had not yet entirely settled. The sample came from just outside the gate-house, at the inlet to the pump-house.

No. 2. From the service-pipe at my house on Shepard Street.

No. 3. From Spy Pond, about twenty feet from the gate-house, at the surface. This showed considerable amounts of infusoria.

No. 4. From Little Pond, about twenty feet from the gate-house, at the surface.

No. 5. From the filter-basin, close to the wall next to Little Pond. The water was flowing in here in a strong stream, which

the men who were working in it said was quite warm as compared with the water of the pond.*

No. 6. Wellington Brook, near the gate-house, just under the ice.

No. 7. Wellington Brook, about fifty feet above the stream coming from the direction of the pig-pen of Mr. Richardson.

No. 8. The shallow well in Mr. Crosby's field, Pond Street, Arlington. This is not, strictly speaking, a well, but is a box through which the water from the drain which underlies a portion of the field passes. It is the same place that has been spoken of at the hearings.

No. 9. The well in Mr. Crosby's kitchen, Pond Street, Arlington. It having been stated at the hearings that this well was a bad one, it was deemed desirable to obtain a sample of the water for comparison with the other waters.

No. 10. Cochituate water, as drawn from the faucet in my laboratory, 114 State Street, Boston.

These samples, with the exception of 2 and 10, were procured on the morning of Dec. 13, and immediately taken to my laboratory. No. 10 was drawn on the 15th inst., and No. 2 on the 16th.

The method of analysis followed was that laid down by Profs. Wanklyn and Chapman for the determination of ammonia. The solid residue was determined in the usual manner by evaporation to dryness. The results of these ten analyses will be found in Table No. I. In the case of samples Nos. 4 and 5, it was deemed advisable to make full analysis as showing more nearly the relation between the two samples of water. These analyses, taken in connection with the two former, show conclusively, I think, that the water in the filter-basin does not come from Little Pond, but from the springs which abound in this locality. In digging out the easterly end of Little Pond, a similar set of springs was found. These were analyzed at that time, with the results shown in Table No. II.

In Table No. II. I have collected all the analyses of the waters in the vicinity of Fresh and Spy Ponds to which I have access.

* The temperature of the water in the pond, as taken by Mr. Dudley on the 15th, was 39° F.; of the water in the filter-basin, 46° F.; and of the air over the basin, at noon, 35°.

I have also added a number of analyses of Mystic and Cochituate Ponds, and Merrimack and Charles Rivers, together with a single analysis of Schuylkill River water.

The analyses of Charles River and Merrimack water are quoted as being the best-known instances of the use of filtering-galleries. It is noticeable, however, in both these cases, that a considerable portion of the water is evidently not derived from the rivers, but from the springs uncovered in digging the galleries. They thus afford exactly parallel cases to the filtering-basin at Little Pond.

The ground-water of Fresh, Spy, and Little Pond basins, is so totally different from that of Lake Cochituate, and the surface-water which is carried off by the two rivers, that it is difficult to make any comparison between them.

The basin in which these ponds lie has evidently been at one time beneath the ocean, as all the ground is saturated with lime and magnesia salts: these, entering into the spring waters, serve to make them hard. In fact, all the ground-water, as distinguished from the mere surface-flow, is in this vicinity extremely hard, as is shown by numerous analyses of wells that have been made in the vicinity of Boston, of which the Crosby Well is a fair example.

The waters of Spy, Little, and Fresh Ponds, are evidently, to a considerable extent, derived from these ground-waters, as is shown by the amount of solid matter which they leave on evaporation. Wellington Brook partakes, to a smaller extent, of the same characteristic, being derived from springs in part. Lake Cochituate and Charles and Merrimack Rivers, lying outside of this basin, have an entirely different character: they are all largely derived from surface-drainage, and consequently are much softer water, and much more free from earthy matter. They are also much more variable waters than Fresh Pond. Fresh Pond, being supplied to a considerable extent from underground sources, remains very constant in composition.

Since comparison by amount of solid residue is out of the question, we must fall back upon another method.

We cannot compare them by the amount of organic and volatile matter, because while this, in the case of the rivers and Lake Cochituate, very nearly represents the amount of organic matter

present, in the case of the ponds, it also includes a considerable amount of water which is in combination with the lime and magnesia salts, and which is not expelled at 212° F. The amounts of lime and magnesia salts in these waters are much less than in Thames water, and are not present in sufficient quantity to do any harm beyond rendering the water slightly hard. The ammonia determinations fortunately give us a method of comparison. The amount of ammonia in the water gives us with a great deal of accuracy a means of judging of the purity of water, and its freedom from sewage, or contamination from animal sources. The changes which take place in animal matter when in a state of decay may be briefly described as follows. The first change which takes place is their splitting up into carbonic acid, and compounds similar to ammonia. If oxygen is plenty in the water, these compounds are soon converted into nitrates, which are, in turn, decomposed, nitrogen being set free.

In the case of the shallow well in Crosby's Field, on which, it is said, six cords of night-soil, and six cords of stable-manure, have been spread annually for the last twenty years, we have this process well illustrated. The ammonia has all been oxidized to nitric acid; and we have a considerable amount of nitrates present, but almost no ammonia, either free, or capable of being set free. Now, it will be noticed, in the tables we have two columns, headed Free Ammonia and Albuminoid Ammonia. The free ammonia is perfectly harmless, having been once in the form of animal or vegetable matter: this has been decomposed, and it is set free. The albuminoid, however, represents the animal or vegetable matter that is in the water, and is capable of yielding ammonia: this indicates, to a great extent, the purity of the water, or, rather, its fitness for domestic use; if it increases very much, the water is to be looked upon with suspicion.

It is generally considered that one part of albuminoid ammonia is equal to ten parts of solid sewage-matter. Thus, taking the maximum amount as found in Fresh Pond Feb. 22, 1875, 100,000 pounds, or 12,004 gallons, would contain .155 pounds of solid sewage-matter; Wellington Brook, June 16, 1875, would contain in the same amount .090 pounds, which is a little in excess of the amount contained at the previous determination, which was .064 pounds; while Cochituate, Dec. 15, contained .100

pounds: so that Wellington Brook compares very favorably with Cochituate, and is better than Fresh Pond water as taken from the surface, which contains .160 pounds in the same amount. One thing is worthy of remark in this connection; and that is, the purification of the water as it passes through the pipes. The water as delivered in a city is almost always more pure than when taken from the gate-house, or inlet. This is well shown in all the examples quoted. Thus the albuminoid ammonia in Fresh Pond water, as taken from the pond Dec. 13, was .0160 parts in 100,000: as taken at the house on the 16th, it was .0060 parts. It must be remarked, however, in this connection, that the water taken immediately under the ice is generally below the average in purity. Cochituate from pond, June 16, 1875, contained .0032 parts; from my office, June 18, it contained .0070 parts; Merrimack, at Lowell filter-basin, .0037 parts; service-pipe in Lowell, .0013 parts; filter-basin at Waltham, .0103; house-service, .0033. The above quotation of Cochituate does not follow the rule: it is, however, an exceptional case. Numerous determinations made by Prof. Nichols show that the water as delivered in Boston is better than when it left the lake.

In fact, Nature understands her business, and, if we only give her time enough, will take care of all noxious organic matters in water. It is only when such matters are taken fresh into the system that danger is to be apprehended.

Now, since the conduit enters into Fresh Pond comparatively near the surface, and at a distance of over half a mile from the inlet pipe to the water-works (which is at least twelve feet below high-water mark), and discharges into a body of water sufficient for nearly two years' supply for the whole city, it would be probably many months from the time its water entered the pond before it was taken out. And moreover, since these waters of Little Pond, Spy Pond, and Wellington Brook, so closely resemble Fresh Pond in all particulars, I can see no possible damage that may arise from their use.

In respect to Spy Pond, however, I think further investigation would be advisable. There is found in this pond a small green microscopic plant, which is very much more abundant during some seasons of the year. This plant seems to be closely allied to the red snow of the arctic regions, being a simple cell.

It is very readily removed from the water by filtration; and when in the growing state, in winter, it seems to impart no bad taste or odor to the water; but in the spring, as the weather gets hot, it dies, and then the water for some time is said to be very offensive.

I would therefore recommend that the supply from Wellington Brook and the filter-basin at Little Pond be utilized at once; I see no necessity for carrying Wellington Brook into Little Pond as proposed; it will not be improved by the operation; and that Spy Pond be closely watched for a year or two, with frequent analyses, and that, if needed, the water be drawn off when at its best, and filtered before it is admitted into Fresh Pond.

Of the analyses given, those marked H. are by Prof. Horsford; those marked M., by Mr. Mariner, who was at that time a student of Prof. Horsford's; W. are by Prof. Edward S. Wood; N. are by Prof. William R. Nichols, who has devoted much time and attention to this subject, under the direction of the State Board of Health, and whose papers in its annual reports will be found extremely valuable reading; the one marked C. is by Dr. Cresson of Philadelphia; while those marked S. are by myself, and have been made for the benefit of the Water Board of Cambridge.

It will be seen from these analyses, that, while the water supplied to Cambridge is much harder than most of the waters quoted, in point of purity, and freedom from sewage-matter, it compares favorably with the best of them; being fully equal in this respect to Cochituate, when delivered from our hydrants.

To show the rapid manner in which sewage is eliminated from water, I give some quotations from eminent English authorities.

Dr. Frankland says, in 1867, in the "Quarterly Journal of Science," "The population in the basin of the Thames above where water is taken is 1,000,000, the drainage of some 600,000 of whom is poured into the river. This sewage is so thoroughly oxidized, that no trace of it can be detected in an unoxidized state. The average flow where the companies take their supply is 800,000,000 gallons daily: the sewage contained would be $\frac{2250}{100000}$."

Dr. Letheby states, "I have arrived at a very decided con-

clusion, that sewage, when it is mixed with twenty times its volume of running water, and has flowed a distance of ten or twelve miles, is absolutely destroyed ; the agents of destruction being infusorial animals, aquatic plants and fish, and chemical oxidation."

The Royal Commission on the water-supply of London says in 1869, " But though, for these reasons, we believe that the organic contamination of the Thames is much less than is commonly imagined, still it would be sufficient to do great mischief, were it not for a most beneficial provision of Nature for effecting spontaneously the purification of the streams. Some of the noxious matter is removed by fish and other animal life ; and a further quantity is absorbed by the growth of aquatic vegetation : but, in addition to these abstractions, important changes are effected by chemical action. The organic compounds dissolved in water appear to be of very unstable constitution, and to be very easily decomposed ; the great agent in this decomposition being oxygen, and the process being considerably hastened by the motion of the water. Now, as such waters always contain much air dissolved in them, the decomposing agent is ready at hand to exert its influence the moment the matter is received into the water, in addition to which the motion causes a further action by the exposure to the atmosphere ; and when (as in the Thames) the water falls frequently over weirs, passes through locks, &c., causing further agitation and aeration, the process must go on more speedily and effectually. The effect of the action of oxygen on these organic matters, when complete, is to break them up, to destroy all their peculiar organic constitution, and to re-arrange their elements into permanent inorganic forms, innocuous, and free from any deleterious quality. This purification process is not a mere theoretical speculation. We have abundant practical evidence of its real action in the Thames and other rivers."

In order to show the quality of Thames water as referred to above, I annex Table No. III., which gives the results of the analysis as made for the month of October, 1876, by Mr. Tidy, for the society of Medical Officers of Health. As will be seen, these waters differ from Fresh Pond water mainly in the amount of lime they contain.

TABLE I.

PARTS IN 100,000 PARTS OF THE WATER.

ANALYSES BY S. P. SHARPLES. WATER TAKEN DECEMBER 13 TO 16, 1876.

Location.	Ammonia.			Solid Residue.			Chlorine.	Sulphuric Acid, SO_3	Lime.	Magnesia.	Color, &c.
	Free.	Albuminoid.	Total.	Inorganic.	Organic and Volatile.	Total Residue.					
Fresh Pond	.0160	.0160	.0320	10.50	3.50	14.00					Slightly milky.
Fresh Pond Service, No. 9 Shepard St.	.0048	.0060	.0108	9.00	3.50	12.50					Very slightly milky.
Spy Pond	.0192	.0192	.0384	9.50	4.70	14.20					Small green specks in water.
Little Pond	.0070	.0120	.0190	8.00	6.00	14.00	1.73	1.02	3.00	1.08	Clear, colorless.
Filter Basin	.0080	.0054	.0134	14.00	4.50	18.50	3.09	1.19	5.00	2.16	" "
Wellington Brook, near Gate House	.0048	.0064	.0112	7.00	3.00	10.00					" "
Wellington Brook, above the Piggery	.0048	.0064	.0112	7.50	3.50	11.00					" "
Crosby's Drain	.0015	.0128	.0143	13.00	12.50	25.20					" "
Crosby's Well	.0010	.0096	.0106	36.00	6.50	42.50					" "
Cochituate	.0032	.0100	.0132	1.60	1.90	3.50					Yellowish.

TABLE II.

PARTS IN 100,000 PARTS OF THE WATER.

Date.		Source.	Ammonia.			Solid Residue.			Chlorine.	Sulphuric Acid, SO_3	Lime.	Magnesia.	Observer.
			Free.	Albuminoid.	Total.	Inorganic.	Organic and Volatile.	Total Residue at 212° F.					
1853	July . .	Fresh Pond				8.51	2.31	10.83	1.95	.73	1.83	.63	M.
1872	Oct. . .	" "				16.49	5.00	21.49					S.
1873		" "				9.72	4.05	13.77					H.
1875	Feb. 22	" " Top	.0170	.0155	.0325	8.00	5.00	13.00	1.99	1.19	2.70	1.08	S.
1875	Feb. 22	" " Bottom				9.00	5.00	14.00					S.
1875	Mar. 12	" " Service				9.00	4.00	13.00					S.
1875	June 2	" " "	.0010	.0050	.0060	11.00	3.00	14.00					S.
1875	June 16	" " "	.0010	.0050	.0060	9.50	3.00	12.50					S.
1876	Mar. 13	" " "	.0048	.0086	.0134	10.00	4.20	14.20					S.
1876	Dec. 16	" " "	.0048	.0060	.0108	9.00	3.50	12.50					S.
1876	Dec. 13	" " Top	.0160	.0160	.0320	10.50	3.50	14.00					S.
1875	June 16	Alewife Brook	.0050	.0120	.0170	9.50	4.50	14.00					S.
1870		Spy Pond Outlet				9.60	6.40	16.00					H.
1875	Feb. 22	" " Top	.0124	.0217	.0341	12.00	5.00	17.00	2.53	1.02	3.50	1.22	S.
1875	Feb. 22.	" " Bottom				12.00	5.00	17.00					S.
1875	June 16	" " Top	.0060	.0090	.0150	11.70	3.00	14.70					S.
1876	Dec. 13	" " "	.0192	.0192	.0384	9.50	4.70	14.20					S.
1875	June . .	Little Pond, Top	.0016	.0110	.0126	8.70	4.50	13.20					S.
1876	Dec. 13	" " "	.0070	.0120	.0190	8.00	6.00	14.00	1.73	1.02	3.00	1.08	S.
1876	Aug. 9	Filter Basin	.0254	.0231	.0485	12.00	6.00	18.00	2.21	1.27	5.00	2.88	S.
1876	Dec. 13	" "	.0080	.0054	.0134	14.00	4.50	18.50	3.09	1.19	5.00	2.16	S.
1876	Mar. 13	Springs in Little Pond	.0064	.0064	.0128	13.20	6.8	20.00	1.92	.68	4.00	1.98	S.
1876	Mar. 13	" " " "	.0128	.0120	.0248	13.40	6.6	20.00	2.57	.51	4.50	1.62	S.
1876	Mar. 13	" " " "	.0088	.0080	.0168	18.00	4.5	22.50	2.60	0.00	5.00	1.26	S.
1875	June 16	Wellington Brook	.0020	.0090	.0110	7.50	3.00	10.50					S.
1876	Dec. 13	" " above Pig-pen	.0048	.0064	.0112	7.50	3.50	11.00					S.

TABLE II. — *Continued.*

PARTS IN 100,000 PARTS OF THE WATER.

Date.		Source.	Ammmonia.			Solid Residue.			Chlorine.	Sulphuric Acid, SO_3	Lime.	Magnesia.	Observer.
			Free.	Albuminoid.	Total.	Inorganic.	Organic and Volatile.	Total Residue at 212° F.					
1876	Dec. 13	Wellington Brook, below Pig-pen	.0048	.0064	.0112	7.00	3.00	10.00					S.
1875	June 16	Mystic, at Gate-house	.0033	.0100	.0133	5.20	4.50	9.70					S.
1874	Sept. 17	" " "	.0084	.0230	.0334	5.00	9.40	14.40	2.60				W.
1873		" " "				6.49	4.85	11.34					H.
1873	June 13	" " "	.0134	.0204	.0378	8.42	2.04	10.46	2.02				N.
1873	July 4	Cochituate	.0033	.0120	.0153	2.84	2.80	5.64	.34				N.
1874	May	" Office, 114 State Street	.0040	.0120	.0160	2.10	2.40	4.50					S.
1875	June 16	" Pond	.0032	.0032	.0064	3.00	4.00	7.00					S.
1875	June	" Office, 114 State Street	.0010	.0070	.0080	4.00	1.50	5.50					S.
1876	Dec. 15	" " "	.0032	.0100	.0132	1.60	1.90	3.50					S.
1875	Dec.	" Institute Technology	.0035	.0113	.0148	2.84	2.06	4.90					N.
1874	Jan. 1	Merrimack at Lowell, 100 feet from Shore	.0053	.0100	.0153	2.48	2.00	4.48	.20				N.
1874	Jan. 1	Merrimack at Lowell, from Filter-basin	.0063	.0037	.0100	5.20	1.20	6.40	.26				N.
1874	Jan. 2	Merrimack as delivered in Lowell	.0037	.0034	.0071	6.28	1.24	7.52	.30				N.
1873	Dec. 16	Charles River, Waltham	.0060	.0164	.0224	3.88	1.84	5.72	.40				N.
1873	Dec. 16	" Filter-basin	.0047	.0056	.0103	5.60	0.92	6.52	.38				N.
1873	Dec. 16	" Reservoir	.0049	.0049	.0098	5.52	0.88	6.40	.36				N.
1873	Dec. 16	" House-service	.0020	.0013	.0033	5.56	0.96	6.52	.34				N.
1875	June 16	Drain in Crosby's Field	.0010	.0090	.0100	22.00	14.50	36.50					S.
1876	Dec. 13	" " "	.0015	.0128	.0143	13.00	12.50	25.50					S.
1876	Dec. 13	Well in Crosby's Kitchen	.0010	.0096	.0106	36.00	6.50	42.50					S.
1875	Jan. 19	Schuylkill	.0145	.0367	.0512	8.68	3.31	11.99	.85	2.02	1.62	.91	C.

TABLE III.

PARTS IN 100,000 PARTS OF THE WATER.

Thames Water Companies.	Ammonia.			Solid Residue.			Chlorine.	Sulphuric Acid, SO_3	Lime.	Magnesia.
	Free.	Albuminoid.	Total.	Inorganic.	Organic and Volatile.	Total.				
Grand Junction	.0000	.0114	.0114			29.14	1.34	2.57	11.84	0.56
West Middlesex	.0000	.0114	.0114			29.16	1.43	2.37	11.52	0.67
Southwark.	.0014	.0114	.0128			28.86	1.43	2.18	11.76	0.67
Chelsea	.0000	.0100	.0100			29.86	1.43	2.47	11.92	0.67
Lambeth.	.0014	.0100	.0114			28.56	1.43	2.47	11.61	0.63

Yours respectfully,

STEPHEN P. SHARPLES, S.B.

114 State Street, Boston, Dec. 17, 1876.

REPORT

OF

THE WATER REGISTRAR.

WATER REGISTRAR'S OFFICE,
CAMBRIDGE, Dec. 11, 1876.

TO THE WATER BOARD.

THE undersigned herewith presents his Report of the receipts, expenditures, and abatements for the year ending Nov. 30, 1876, together with a statement of the number of water-takers, fixtures, &c., and other matters in his department.

Receipts.

Water Rates	$117,202 21	
Meter Rates	25,506 93	
City Rates	10,837 87	
		$153,547 01
Water Rates for 1875	6,831 46	
Meter Rates for 1875	1,655 52	
City Rates for 1873–75	17,132 77	
		25,619 75
		$179,166 76
Supply-pipe, laying and repairing		8,075 02
Fines, off and on Water, and Sundries		570 50
Rent of House at Pipe-yard		150 00
Total		$187,962 28
Amount paid to the City Treasurer		187,402 53
Balance (memoranda of A. F. Fifield)		$559 75

Expenditures.

Care and Repair Account; viz., —		
General Repairs . . .	$6,806 54	
Pumping Service . . .	15,638 33	
Office Expenses . . .	6,141 78	
		$28,586 65
Extension Account		104,143 11
Supply Account		7,071 52
Total		$139,801 28

Due and Unpaid.

Water Rates	$3,685 00
Meter Rates	5,047 09
City Rates	1,225 00
Supply-pipe and Repairs, Sundry Parties . .	12,268 80
Supply-pipe and Repairs, City	4,408 08
Total	$26,633 97

Statement of the yearly revenue received from water-rates since the purchase of the works by the city: —

From April 28, 1865,	to	Dec. 1, 1865 . . .	$32,367 19
" Dec. 1, 1865,	"	1866 . . .	40,073 27
" " 1866,	"	1867 . . .	52,733 62
" " 1867	"	1868 . . .	63,747 42
" " 1868	"	1869 . . .	76,149 30
" " 1869	"	1870 . . .	92,606 95
" " 1870	"	1871 . . .	111,782 65
" " 1871	"	1872 . . .	127,201 30
" " 1872	"	1873 . . .	146,117 32
" " 1873	"	1874 . . .	153,634 27
" " 1874	"	1875 . . .	138,880 37
" " 1875	"	1876 . . .	153,547 01
Arrears, 1873	"	1875 . . .	25,619 75

The Report of the Water Registrar for year ending Nov. 30, 1875, showed amounts due from the city for 1873, 1874, and 1875, for fire hydrants, reservoirs, and watering streets, a total of . .	$38,649 54
The City Council subsequently amended the Ordinance in relation to Water-Works, making special rates to the city, as follows: reducing rates for water for watering streets from three cents to one cent and a half per hundred gallons, and reducing the rate per hydrant (or reservoir) from $30 to $11, thereby causing a total reduction of .	21,516 77
Balance paid	$17,132 77

A further reduction has been made this year by the discontinuance of 15 of the 29 reservoirs included in the above.

A careful examination of all premises supplied with Fresh Pond water was made early in the year, and a revision of the office-list of fixtures was made in accordance therewith, largely to the benefit of the city: but some errors in transfer in opening new books, consequent upon change of Registrar; a large number of fixtures subsequently removed by the owners; and the stringency of the times and the numerous vacant houses and tenements causing many owners to order water shut off, — have resulted in abatements to the amount of $12,840.48; and water-rates paid, have, for the latter reasons, been refunded to the amount of $713.37.

In the last Report there were remaining off for non-payment of Rates	130	
Let on in 1876	21	
		— 109
Shut off in 1876 (for non-payment, or per order of owners on account of vacancy)	414	
Let on again	229	
		— 185
Still remaining off		294

The question as to allowance for vacant tenements in houses occupied by more than one family, and unused fixtures in single houses, as also the numerous cases where single supplies do

duty for double houses, and sometimes for whole blocks, have proved quite perplexing; and a necessary enforcement of the ordinance has caused some individual hardships. But most of such cases are now provided for by the seal-lock invented by Mr. John Miller, the foreman of the Supply and Repair Department, and, by approval of the Board, at once placed in use.

250 new supplies have been laid during the year; but some of them are not yet in use.

6 meters have been removed during the year, and 16 have been set.

The total number of meters now in use is 105, located as follows; viz.: —

WHERE ATTACHED.	SIZE OF METERS.						
	$\frac{5}{8}$-in.	$\frac{3}{4}$-in.	1-in.	$1\frac{1}{2}$-in.	2-in.	3-in.	4-in.
A. H. Hews & Co., Pottery				1			
American Net and Twine Co.				1			
American Ship Chandlery Co.					1		
Beck Hall, Mrs. Moering				1			
Boston & Albany R. R.				1			
Boston & Lowell R. R.			1		3		
Boston Chemical Works			1				
Boston Rolling Mill					1		
Boston Stamping and Manufacturing Co.					1		
Boston Car Wheel Co.			1				
Boynton Packing Co.				1			
Brown & Nichols, Planing Mill			1				
Blake Hose Association		1					
Botanic Garden			1				
Braman, Shaw, & Co., Furniture Manuf.				1			
B. P. Clark & Co., Confectioners				1			
City of Cambridge					2		
City of Cambridge, Almshouse					1		
C. L. Jones & Co., Soap Manufactory		1					
C. A. French, Hotel			1				
Cambridge Gas Light Co.					1		
Curtis Davis, Soap Manufactory				1			
Dover Stamping Co.		1	1				
D. G. Pratt, Wood Turner			1				
D. Osborn Estate, Planing Mill					1		
Fitchburg R. R.					1		
F. Draper & Co., Stationers' Ware Manuf.		1					
F. Geldowsky, Furniture Manuf.				1			
G. G. Page & Co., Box Factory							
Geo. Woods & Co., Organ Manufactory					1		
Geo. A. Denham & Co., Picture Frame Manuf.			1		1		
Geo. M. Rogers, Tenement Block						1	

WHERE ATTACHED.	SIZE OF METERS.						
	⅝-in.	¾-in.	1-in.	1 -in.	2-in.	3-in.	4-in.
House of Correction					1		
H. O. Houghton & Co., Riverside Press		1	1				
Harvard Laundry		1					
Henry Thayer & Co., Man'f'g Pharmaceutists					1		
Hancock & Greely, Planing Mill				1			
Hale, Teele, & Bisbee, Soap Manufactory			1				
H. M. Clark, Private Stable		1					
H. M. Wyeth, Brick Yard			1				
Harvard College		1	2	2			
" " Boat House		1					
" " Memorial Hall					1		
Holyoke House					1		
J. P. Squire & Co., Pork Packers			1		2		
John Wilson & Son, Printers			1				
John Reardon & Sons, Soap Manufactory		1					
John B. Wood, Dredging Machine					1		
John L. Sands, Brick Yard			1				
James C. Davis & Son, Soap Manufactory			1				
Leonard Cox, Laundry			1				
Little, Brown, & Co., Book Bindery			1				
Low & Knight, Tannery				1			
Mt. Auburn Cemetery				2	1		
Mason & Hamlin, Organ Manufactory		1	2				
Middlesex Bleachery		1					
New England Glass Co.					1		
New England Brick Co.				1			
O. S. Bullock, Machinist			1				
Oleomargarine Factory			1				
Petingill & Rider, Cider Manufactory		1					
Prospect House				1			
Revere Sugar Refinery						1	
Reversible Collar Co.			1				
Russell & Dimick, Barrel Factory		1					
Sortwell & Co., Distillers					1		
Standard Ammonia Co.		1					
Sylvester Tower, Piano-Forte-Key Maker			1				
S. M. Cofran, Brick Yard					1		
St. Mary's Church		2			1		
Union Glass Co.			2				
Union Railway Co.		3	5	2	2		
Woodbury & Co., Planing Mill					1		
Welch, Bigelow, & Co., University Press		1					
Walworth Manufacturing Co.				1			
		21	33	20	29	2	

Water is now supplied to

10,262 Families.
720 Stables.
376 Shops, Stores, Offices, &c. (in addition to those above enumerated as supplied by meter), by the following fixtures: —
12,257 Faucets.
3,170 Wash Basins.
1,680 Wash Tubs.
1,724 Bath Tubs.
3,794 Pan Closets.
13 Door Closets.
446 Slop Closets.
32 Hopper Closets.
56 Urinals.
79 Yard Hydrants.
13 Fountains.
1,075 Hose.
5 Tumbler Washers. Exclusive of the Schoolhouses, Engine-Houses, Police Stations, and other City buildings, using the additional number of
76 Faucets.
30 Wash Basins.
4 Bath Tubs.
5 Urinals.
31 Pan Closets.
12 Door Closets.
5 School Closets, 114 Seats.
4 School Urinals, 417 Jets.
49 School Sinks, 239 Jets.
6 Stables.
6 Hose.
1 Steam Engine.
560 Fire Hydrants.
14 Fire Reservoirs.
17 Drinking-Fountains.
4 Garden Hydrants.

Respectfully submitted.

J. WARREN COTTON, *Registrar.*

REPORT

OF THE

COMMITTEE ON ACCOUNTS OF THE WATER BOARD.

In Cambridge Water Board,
December, 1876.

The Standing Committee on Accounts submits the following

REPORT.

We have examined the books and accounts of the Water Registrar, J. Warren Cotton, to the end of the financial year, Nov. 30, 1876, and compared them with the vouchers, and find that the same are correct.

J. WARREN MERRILL,
FRANK A. ALLEN, } *Committee.*

REPORT

OF THE

SUPERINTENDENT OF THE WATER-WORKS.

CAMBRIDGE, DEC. 6, 1876.

TO THE PRESIDENT OF THE CAMBRIDGE WATER BOARD.

IN accordance with the city ordinance requiring the Superintendent, in the first week in December, to report the general condition of the works for the year ending Nov. 30, I would respectfully submit the following Report.

Water Supply and Ponds.

During the year, a cast-iron thirty-six-inch pipe has been laid to connect Spy Pond with Little Pond, and a gate-house has been erected at the Spy Pond end. A drain has been constructed to take the surface-water from the streets and low lands on the north-easterly side of Little Pond, around into Alewife Brook, to prevent it from flowing into the pond.

The conduit from Fresh Pond to Little Pond has been finished, and gate-houses built at Fresh Pond, Wellington Brook, and Little Pond, by which, in case of a short supply, the water can be let into Fresh Pond from other sources.

Black's Nook so called, in Fresh Pond, has been partly cleaned out, and much improved. The lower end of Fresh Pond has been greatly improved by digging out about eighteen acres to the depth of several feet; and the banks have been graded, and neatly paved with stone to a point above high-water mark. A gate-house has been built at the outlet of Fresh Pond at Alewife Brook, the gates in which have been kept constantly shut, to prevent the water from the brook running into the pond. A gate-house has also been built over the screen chamber, in the four-foot suction-pipe leading from the pond to our engine-house.

Engine-House, &c.

The two pumps of the "Worthington" pattern are in good condition. They have a capacity of five million gallons each in twenty-four hours, and they are worked alternately, changing once a month. The daily average time of pumping is about ten hours and a half.

The engines have been kept in good running-order by our skilful engineer, Mr. E. C. Brooks, without any assistance from outside help. The engine and boiler rooms are kept clean and orderly. The two force main pipes from the engine-house to the reservoir are in good condition, no repairs having been required during the year.

The old engine and boiler houses, and coal-sheds, have all been taken down and removed.

Distributing Pipes.

We have now in the city about ninety miles of pipes, — eighty-four miles of cast-iron pipe, and six miles of cement pipe. Most of this is laid in the public and accepted streets; but some is in streets and courts not accepted. Some pipes have been lowered during the year to prevent freezing.

Reservoir and Standpipe.

The walls of the reservoir remain firm: they have been whitewashed, the walks around have been regravelled, and the grass banks have been properly cared for, and every thing about this attractive place is in good condition. The reservoir is seventy-seven feet, and the standpipe one hundred and twenty feet, above marsh level.

Hydrants.

Thirty-six post hydrants have been set the past year, which, added to those previously set, make 372 flush, and 195 post hydrants, — in all, 567. We are using the Pattee and Perkins pattern, which give us the least trouble, and work to the entire satisfaction of the Chief Engineer of the Fire Department, who, under proper authority, has the locating of all hydrants. As fast as the flush hydrants get out of order, they are replaced by post hydrants.

Meters, &c.

We have 105 meters in good working-order applied on the premises of water-takers, all of which have been boxed and packed to prevent freezing. All the principal gates have been examined, and packed for the winter.

Engines.

The engines in the past year of 364 days have run 3,812 hours and 51 minutes; a daily average of 10 hours, 29 minutes. There have been consumed 1,671,012 pounds of coal; a daily average of 4,591 pounds. The engines have made in the year 2,954,792 revolutions; a daily average of 8,117 revolutions. They have pumped during the year 887,637,600 gallons; a daily average of 2,438,564 gallons.

The monthly supply and daily average are shown in the following table, covering fifty-two weeks: —

	Days.	Total Gallons per month.	Daily average per month.
December, 1875	35	83,335,200	2,381,006
January, 1876	28	68,374,200	2,441,935
February, "	28	72,907,500	2,603,839
March, "	35	88,067,700	2,516,220
April, "	28	60,298,800	2,153,528
May, "	28	62,992,800	2,249,743
June, "	35	96,229,500	2,749,414
July, "	28	85,680,300	3,060,010
August, "	28	71,766,300	2,563,082
September, "	35	83,145,000	2,375,571
October, "	28	58,606,200	2,093,078
November, "	28	56,234,100	2,008,360
	364	887,637,600	

Drinking-Fountains.

We have sixteen in use, all of which are now furnished with spring faucets to prevent the waste of water. They are located as follows: —

North Avenue, corner of Walden Street.
North Avenue, opposite Mechanics' Exchange.
Cambridge Common.
Harvard Square, opposite the store of Alfred Wood.
Brattle Square, opposite Brewer's Block.
Inman Square, junction Cambridge and Hampshire Streets.
Cambridge Street, corner of Fifth Street.
Bridge Street, junction Cambridge Street.
Third Street, between Main Street and Broadway.
Hampshire Street, junction Broadway.
Broadway, corner Norfolk Street.
Lafayette Square, front of Universalist Church.
Central Square, opposite the store of D. U. Chamberlin & Co.
Central Square, opposite the store of J. A. Holmes & Co.
Fort Washington.
Putman Avenue, corner Pearl Street.

Standpipes for Street Watering.

One has been removed from Main Street, West of Quincy, leaving thirty-four in use, located as follows: —

North Avenue, near the Common.
North Avenue, near Forest Street.
North Avenue, near Beech Street.
North Avenue, near Day Street.
Concord Avenue, junction Garden Street.
Near University Press.
Inman Street, near Broadway.
Broadway, corner Winsor Street.
Columbia Street, near Austin Street.
Green Street, near Western Avenue.
Cambridge Street, at Inman Square.
Cambridge Street, near Warren Street.
Gore Street, opposite Schoolhouse.
Otis Street, near Third Street.
Junction Bridge and Cambridge Streets.
Fifth Street, near Thorndike Street.
North Avenue, near Shepard Street.
Dana Street, corner Chatham Street.

Brattle Square, corner Sparks Street.
Broadway, corner Sixth Street.
Dublin Street, near Fitchburg Railroad.
Broadway, near Third Street.
Western Avenue, near Howard Street.
Third Street, near Rogers Street.
Main Street, near Portland Street.
Magazine Street, opposite Warland Street.
Main Street, near Hancock Street.
Kirkland Street, near Quincy Street.
Brattle Street, near Fayerweather Street.
Brattle Street, near Fresh Pond Lane.
Cambridge Street, near Winsor Street.
Mt. Auburn Street, near Athens Street.
North Avenue, near Spruce Street.
Brookline Street, corner Putnam Avenue.
Broadway, junction Hampshire Street.

Galvanized Service-Pipe used during 1876.

Diameter in Inches.	Number of Pipes.	Length in Feet.
2	6	600
1½	2	242
1¼	1	80
1	7	810
¾	234	13,191
Total	250	14,923

The total number of supply-pipes is now 6,820.

Brass Fittings used in 1876.

2-inch Cocks	24
1½ " "	7
1¼ " "	2
1 " "	14
¾ " Stop and Waste	272
Sidewalk Shut-off	285
Hose-bibb Cocks	41

Garden Hydrants set in 1876.

On premises of water-takers	5
Total number in use	93

STATEMENT OF LOCATION, SIZE, AND NUMBER OF FEET OF MAIN PIPE LAID IN 1876.

IN WHAT STREET.	Diameter in Inches.	Feet of Pipe.
Acacia	4	72
Berkshire	4	160
Belmont	6	16
Broadway	8	24
Bath	4	300
Cottage	6	12
Chauncy	4	50
Charles	4	204
Connecting Spy Pond with Little Pond	36	950
College Grounds	6	1,062
Dunster	6	14
Decatur	6	12
Elmwood Avenue	12	765
Ellery	6	52
Florence	6	226
Fourth	4	36
Fairfield	6	336
Greenough Avenue	4	36
George	4	130
Hawthorne	6	36
Hawthorne	4	540
Lopez	6	12
Mt. Auburn	12	1,355
Mt. Auburn	6	882
Main	6	162
Montgomery	6	110
North Avenue	6	24
Oxford	6	14
Otis	4	20
Plymouth	4	72
Pemberton	6	840
Pleasant	6	474
Pleasant	12	75
Prescott	4	320
Putnam Avenue	16	870
Putnam Avenue	6	75

STATEMENT OF LOCATION, ETC. — *Continued.*

IN WHAT STREET.	Diameter in Inches.	Feet of Pipe.
Richdale Avenue	6	132
Somerset	6	210
Somerset	4	90
Sacramento	6	912
Seckel	6	40
Seckel	4	150
Tannery Lane	6	950
Western Avenue	4	12
West	6	321
West	4	315
Watson	4	12

RECAPITULATION OF MAIN PIPE LAID IN 1876.

950 feet	36-inch.
870 "	16 "
2,195 "	12 "
24 "	8 "
6,924 "	6 "
2,519 "	4 "

Total, 13,482 feet.

BLOW-OFF GATES SET IN 1876.

1	6-inch.
4	1½ "

REGULAR GATES SET IN 1876.

IN WHAT STREET.	Diameter in Inches.	Number.
Acacia	4	1
Charles	4	1
College Grounds	6	2
Ellery	6	1
Fourth	4	3
Hawthorne	6	1
Mt. Auburn	12	2
Mt. Auburn	6	6
Oxford	6	1
Otis	4	2
Pemberton	6	1
Pleasant	6	4
Pleasant	12	1
Putnam Avenue	16	1
Putnam Avenue	6	4
Sacramento	6	1

REGULAR GATES SET IN 1876. — *Continued.*

IN WHAT STREET.	Diameter in Inches.	Number.
Seckel	6	1
Tannery Lane	6	1
Tannery Lane	4	1
Thorndike	4	4
Western Avenue	4	1

RECAPITULATION.

1	16-inch.
3	12 "
23	6 "
13	4 "
Total, 40	

GATES CLEANED OUT IN 1876.

IN WHAT STREET.	Diameter in Inches.	Number.
Bath	1½	1
Brighton	6	2
Brattle Square	6	1
Beacon	1½	1
Belmont	1½	1
Berkshire Place	1½	1
Chestnut	1½	1
Charles	1½	1
Creek	1½	1
Eliot	6	1
Greenough Avenue	1½	1
Green	6	7
Harvard	6	8
Magazine	6	1
Montgomery	1½	1
Meacham	1½	1
Main	6	1
Main	8	1
Pacific	1½	1
Plymouth	1½	1
Putnam Avenue	6	3
Portland	6	1
Richdale Avenue	1½	1
South	1½	1
State	6	1
Somerset	1½	1

STATEMENT

OF STOCK ON HAND DEC. 1, 1876.

Galvanized Pipe.

250 feet 2-inch.
300 feet 1½-inch.
200 feet 1¼-inch.
4,000 feet ¾-inch.
200 feet 1-inch.

Fittings for Service-Pipes.

14 1-inch Hose Bibbs.
6 ¾-inch Hose Bibbs.
40 ¾-inch Compression Bibbs.
2 1¼-inch Screw Cocks.
20 1-inch Screw Cocks.
60 ¾-inch Screw Cocks.
100 1-inch Sidewalk Cocks.
12 ¾-inch Sidewalk Cocks.
50 1-inch M. & F. Cock for Cement Pipe.
1 1½-inch Blow-off Cock.
12 ¾-inch Corporation Cocks.
6 2-inch Corporation Cocks.
10 1½-inch Corporation Cocks.
1 1-inch Corporation Cock.
1 2-inch Stop and Waste Cock.
2 1½-inch Stop and Waste Cocks.
1 1¼-inch Stop and Waste Cock.
31 1-inch Stop and Waste Cocks.
20 ¾-inch Stop and Waste Cocks.
6 ¾-inch Hose Nipples.
12 Gate Spindles.
40 2-inch T's.
15 2×1¼-inch T's.
10 2×1-inch T's.
10 1½-inch T's.
20 1½×1¼-inch T's.
10 1-inch T's.
2 ¾-inch T's.
30 1¼-inch T's.
15 1¼×1-inch T's.
10 1¼×¾-inch T's.
20 1-inch T's.
100 ¾-inch T's.
100 ¾×½-inch T's.
20 ½-inch T's.
30 1½-inch Elbows.
25 1¼-inch Elbows.
20 1-inch Elbows.
100 ¾-inch Elbows.
20 ½-inch Elbows.
25 1-inch Street Elbows.
100 ¾-inch Street Elbows.
15 2-inch Couplings.
15 1½-inch Couplings.
6 1¼-inch Couplings.
50 1-inch Couplings.
50 ¾-inch Couplings.
100 ½-inch Couplings.
10 1-inch Air Chambers.
20 ¾-inch Air Chambers.

100 ½-inch Air Chambers.
10 1½-inch Unions.
8 1¼-inch Unions.
10 1-inch Unions.
50 ¾-inch Unions.
25 1-inch Clips.
20 ¾-inch Clips.
10 ½-inch Clips.
10 2-inch Crosses.
20 2×1¼-inch Crosses.
20 2×1-inch Crosses.
25 1½-inch Crosses.
25 1½×1¼-inch Crosses.
25 1½×1-inch Crosses.
30 1½×¾-inch Crosses.
20 1¼-inch Crosses.
18 1¼×1-inch Crosses.
8 1¼×¾-inch Crosses.
6 1-inch Crosses.
4 1×¾-inch Crosses.
150 ¾-inch Socket Ends.
2 Garden Hydrants.
20 2-inch Nipples.
15 1½-inch Nipples.
15 1¼-inch Nipples.
15 1-inch Nipples.
20 ¾-inch Nipples.
30 ½-inch Nipples.
2 2-inch Plugs.
4 1½-inch Plugs.
2 1¼-inch Plugs.
4 1-inch Plugs.
12 ¾-inch Plugs.
6 ½-inch Plugs.
6 2×1½-inch Bushings.
6 2×1¼-inch Bushings.
4 2×1-inch Bushings.
6 2×¾-inch Bushings.
5 1½×1¼-inch Bushings.
3 1½×1-inch Bushings.
4 1½×¾-inch Bushings.
5 1¼×1-inch Bushings.
4 1¼×¾-inch Bushings.
8 1×¾-inch Bushings.
10 ¾×½-inch Bushings.
30 1-inch Lock Nuts.
20 ¾-inch Lock Nuts.
15 ½-inch Lock Nuts.
6 ⅜-inch Lock Nuts.

Stock at the Pipe Yard.

24 feet 48-inch Pipe.
260 feet 30-inch Pipe.
300 feet 24-inch Pipe.
50 feet 16-inch Pipe.
200 feet 20-inch Pipe.
30 feet 12-inch Pipe.
2,000 feet 10-inch Pipe.
1,800 feet 8-inch Pipe.
1,800 feet 6-inch Pipe.
1,500 feet 4-inch Pipe.
1 24 to 10-inch Cross.
1 20-inch Cross.
1 20 to 10-inch Cross.
1 16 to 12-inch Cross.
1 12-inch Cross.
4 12 to 10-inch Crosses.
7 12 to 6-inch Crosses.
5 12 to 4-inch Crosses.
2 10 to 10-inch Crosses.
2 10 to 8-inch Crosses.
7 10 to 6-inch Crosses.
2 8 to 8-inch Crosses.
2 8 to 6-inch Crosses.
2 8 to 4-inch Crosses.

15 6 to 6-inch Crosses.
6 6 to 4-inch Crosses.
10 4-inch Crosses.
2 30-inch Sleeves.
4 24-inch Sleeves.
3 20-inch Sleeves.
4 16-inch Sleeves.
6 12-inch Sleeves.
6 10-inch Sleeves.
10 8-inch Sleeves.
20 6-inch Sleeves.
8 4-inch Sleeves.
6 3-inch Sleeves.
5 24-inch Clamp Sleeves.
3 12-inch Clamp Sleeves.
3 10-inch Clamp Sleeves.
5 8-inch Clamp Sleeves.
2 6-inch Clamp Sleeves.
3 4-inch Clamp Sleeves.
3 3-inch Clamp Sleeves.
1 30-inch Bend.
2 24¼-inch Bends.
2 24⅛-inch Bends.
2 20-inch Bends.
1 16-inch Bend.
2 12-inch Bends.
10 10-inch Bends.
15 6-inch Elbows.
2 Go-Over Drains.
15 6-inch Elbows.
2 20 to 6-inch Blow-Offs.
5 10 to 6-inch Blow-Offs.
1 12 to 6-inch Blow-Off.
1 24-inch T.
1 24 to 8-inch T.
5 24 to 6-inch T's.
3 20 to 20-inch T's.
1 20 to 12-inch T.
5 16 to 6-inch T's.
1 20 to 10-inch T.
2 20 to 6-inch T's.
1 12 to 12-inch T.
10 12 to 6-inch T's.
1 12 to 8-inch T.
20 10 to 6-inch T's.
22 8 to 6-inch T's.
6 6-inch T's.
4 6 to 4-inch T's.
15 4 to 4-inch T's.
1 24 to 10-inch Reducer.
1 24 to 12-inch Reducer.
1 20 to 10-inch Reducer.
1 20 to 12-inch Reducer.
1 20 to 8-inch Reducer.
1 16 to 6-inch Reducer.
1 12 to 8-inch Reducer.
1 12 to 6-inch Reducer.
8 10 to 6 Reducers.
6 8 to 6-inch Reducers.
3 6 to 4-inch Reducers.
1 4 to 3-inch Reducer.
2 20-inch Caps.
8 12-inch Caps.
2 6-inch Caps.
5 4-inch Caps.
6 10-inch Offsets.
12 6-inch Offsets.
6 4-inch Offsets.
1 12-inch Gate.
1 10-inch Gate.
1 8-inch Gate.
1 6-inch Gate.
4 4-inch Gates.
2 3-inch Gates.
1 4-inch Meter.
3 1-inch Meters.
5 ¾-inch Meters.

5 Small Gates, Frames, and Covers.
1 24-inch Elbow.
1 10-inch Elbow.
6 6-inch Elbows.
1 24-inch Y Branch.
1 12-inch Y Branch.
2 24-inch Check Valves.
12 Standpipes for shutting off Cocks.

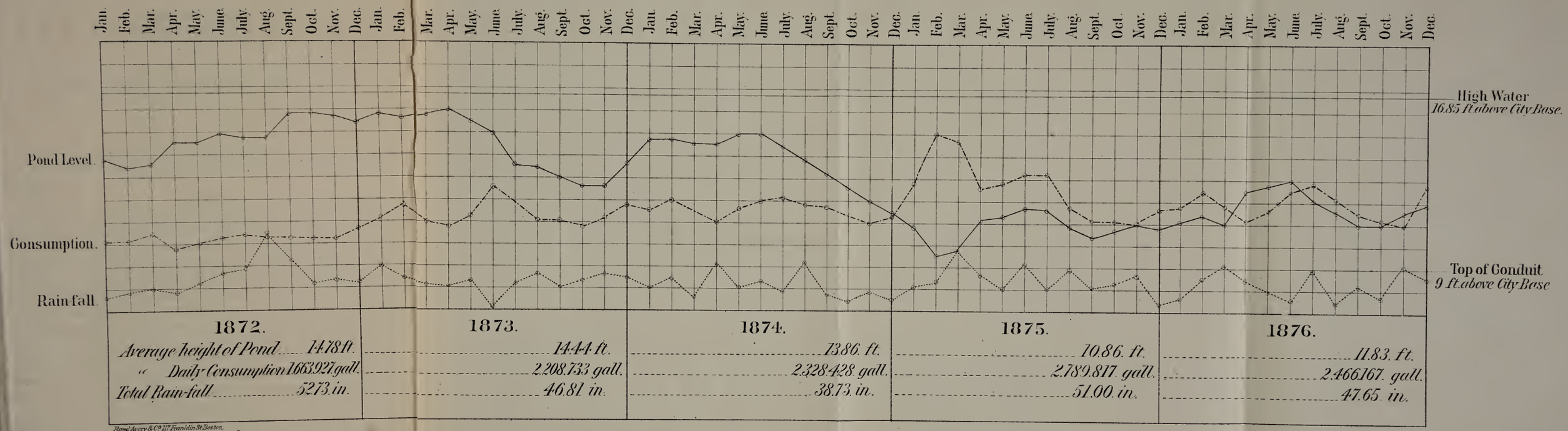
Miscellaneous.

4 Flush Hydrants.
7 Post Hydrants.
175 Tons of Old Junk.
4 Wagons.
2 Hand Carts.
2 Horses.
2 Sets of Harnesses.
1 Pung.
1 Large Hand Pump.
1 Large Boom Derrick.
3 Small Derricks.
300 Pounds of Lead.
100 Pounds of Packing.
275 Shovels.
90 Picks.
100 Wheelbarrows.
4 Iron Bars.
4 Chains.
1 Dozen Lanterns.
1 Grindstone.
1 Platform Scale.
1 Pipe-Thread Cutting Machine.
1 Machine for Drilling.
1 Dwelling-house for Teamster.
1 Stable and Shed.
1 Dwelling-house for the Engineer.

And all the tools in the Engine-house requisite for repairing; likewise all the tools required for laying main pipes and supply pipes.

Respectfully submitted.

S. W. DUDLEY,
Superintendent.


Jan. Feb. Mar. Apr. May. June. July. Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May. June. July. Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May. June. July. Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May. June. July. Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May. June. July. Aug. Sept. Oct. Nov. Dec.
Pond Level.
Consumption.
Rain-fall.
High Water
16.85 ft above City Base.
Top of Conduit
9 ft. above City Base

1872.	1873.	1874.	1875.	1876.
Average height of Pond ..... 14.781 ft.	14.44 ft.	13.86. ft.	10.86. ft.	11.83. ft.
" Daily Consumption 1.663.927 gall.	2.208.733 gall.	2.328.428. gall.	2.789.817. gall.	2.466.167. gall.
Total Rain-fall ..... 52.73. in.	46.81 in.	38.73. in.	51.00. in.	47.65. in.

Rand Avery & Co 117 Franklin St Boston.

The City Base is a line 20.314 ft. below the South Westerly corner of coping of Dry Dock, Charlestown Navy Yard.

Vertical Scale. { Pond Level 1/4 inch = 1 foot. Rain-fall 1 " " " Consumption of water 1/2 in. = 1000000 gallons.

REPORT

OF

THE SCHOOL COMMITTEE FOR 1876.

THE School Committee for 1876 beg leave to offer the following

REPORT.

The external condition of the schools has remained essentially the same as at the beginning of the year. Our chief difficulty has been in adjusting our actual school accommodations, especially in the Primary Department, to the change and growth of population in certain portions of our territory. We have school-room enough for the present number of scholars, and for the prospective increase of several years to come; but, in some instances, children have been, of necessity, excluded from the schools most easy of access to their homes. The Committee, however, have been essentially aided in meeting the wishes of parents and the convenience of children by the uniform readiness of the teachers to take charge of as large a number of pupils as can by any possibility be seated in their respective rooms; and several of the Primary classes at this moment exceed by ten or fifteen per cent the highest number prescribed by our regulations.

The High School building is over-full, so far as the proper arrangement of classes is concerned. Every room, large and small, is occupied. There are in the whole building seats for 450 scholars: the number now on the list is 427. In order to seat these, it is necessary to intrust the several teachers with the order and discipline of classes not under their immediate instruction; but the age and general deportment of the schol-

ars render this charge much less onerous than it would be in schools of a lower grade. In the present financial condition of the city, we cannot recommend the enlargement of the building, especially as the depression of business has also checked the rapid increase of our population; thus postponing a necessity, which, three years ago, seemed imminent and imperative. But, whenever the school shall outgrow the building, the Committee believe, that, in the interest of a wise economy, the enlargement should be a final one. The plans drawn by direction of the Committee of the City Council on Public Property, and now in possession of the city, provide for 700 pupils; and, should the school at some future — perhaps not very distant — day reach that number, it will undoubtedly seem best to have two schools, instead of one, separating either the boys and the girls, the classical and the English departments, or the scholars, from different portions of our extended territory.

As in duty bound, the Committee have endeavored to keep the expenditure for the schools as low as was consistent with their efficiency. A large portion of the disbursement on this account is wholly independent of their control. A great amount of money is annually expended in the purchase of school-books for pupils represented as indigent; and there can be no doubt that the representation is often false. The Committee have done all in their power to check the abuse of this form of public charity, but are, of course, unable to examine individual cases. The only effectual remedy, under the present system, would be the bestowing of the books thus given — as all the alms of the city ought to be dispensed — through responsible agents; but the Committee believe that it would be the part of wise economy, private and public, to have all text-books and necessary school apparatus, at least for the Primary and Grammar Schools, purchased at the charge, and held as the property, of the city. The Superintendent of Schools will call attention to this subject in his Report, annexed to ours, to which we solicit the careful attention of our citizens. The plan suggested has been successfully adopted in several towns and cities. It would undoubtedly, for the first few years, necessitate a considerable increase of our appropriation for schools; but the system, once fully inaugurated, could probably be sustained at an annual

expense very little exceeding the present cost of books for poor children.

The sumptuous style in which several of our schoolhouses are built involves, of necessity, a correspondingly heavy cost in their care, and in essential repairs and alterations. We believe this expensive mode of building in every way objectionable, especially so, as in all our cities the centres of population are liable to frequent and rapid changes; and the closing of a single manufacturing establishment may, in a few months, almost depopulate a school-district. Some of our old wooden schoolhouses are, indeed, a disgrace to the city; but had the neat, simple, modest architecture of the Holmes Schoolhouse been the prevailing type, we might now have had all our schools amply and comfortably accommodated for half the sum that has been invested in three or four of our most costly edifices. We are aware that Cambridge is not alone, nor even among the chief of sinners, in this matter; but we regard it as a grave mistake, and as threatening the well-being of our schools. The tax-payers, burdened with a heavy interest-payment for a debt incurred, in part, for the building of schoolhouses, are thus rendered the more solicitous to stint the annual appropriations for the actual school-work.

There is, however, one item of hitherto unusual expenditure, which the Committee would recommend for the coming year. They have instituted a thorough sanitary survey of the schoolhouses, and have found most of them deficient in the means of ventilation, and many of them in a condition, or with surroundings, otherwise unfavorable to the health of teachers and pupils. These evils ought to be remedied, at whatever cost; but it is believed, that, under judicious management, a very moderate appropriation would supply all the requisites for health, cleanliness, and decency.

Some reduction has been made in the larger salaries in the department of education. The majority of the Committee decided to leave the salaries of five, six, and seven hundred dollars untouched. While they did not regard the compensation thus paid as more than was fairly earned and justly due, they believed, at the same time, that any essential reduction would be injurious to the permanent efficiency of our schools. Probably but a few of our teachers would be called away to neighboring

cities, and their places would seem to be adequately supplied by new, young, and ambitious successors; but those few would be the teachers of longest experience and of well-established reputation, who do more than all the rest to maintain the present high standard of our schools. Our teachers, with hardly an exception, are laboring faithfully and successfully. They labor, too, in a system of mutual counsel and co-operation. They are associated in various ways for study, conference, and improvement. They are conversant with one another's methods; and the younger are greatly benefited by the advice and example of the elder. They recognize superior merit, and are ready to adopt whatever plans have borne the test of fair experiment. The foremost of their number establish the standard toward which all the others aspire and tend. If those foremost members of the profession are transferred elsewhere by overbidding, a lower standard would be the inevitable result; as a like result would ensue from the removal of the chief members of any other profession.

It is believed that the cost of tuition for each scholar in the city, and for each scholar in the several grades, has increased at a much lower rate, since the substitution of paper for a metallic standard of value, than the rate of increase for the general expenditures of the city and for the cost of living in private families. The average payment for tuition is less than twenty dollars for each scholar. For the Primary Schools it is little more than three-fourths of that sum; while in the High School the average cost is a little more than forty-six dollars, the usual private charge for a school of the same grade being two hundred dollars.

The schools have, during the year, given the Committee general satisfaction as to order, discipline, and improvement. The teachers are believed to have done the best work of which they are severally capable. There has not been a single instance in which there has been reason to complain of negligence or indifference. On the other hand, the prevailing spirit among them is that of devotedness to their calling, and interest not only in the reputation of their schools, but in whatever appertains to the well-being of their individual pupils. Pleasure and pride in the proficiency of their better scholars are to be expected as

a matter of course; but we have often been gratified in witnessing their painstaking and persevering efforts in behalf of the most stupid, wayward, and unpromising children placed under their care. The virtual abolition of corporal punishment, never, we trust, to be restored, leaves moral discipline as the only resort, and thus demands in the teacher a higher order of moral fitnesses for the office; but our teachers have shown themselves fully adequate to the increased demand, equally in firmness and resolution, and in patience and meekness. Many of the children come from families in which brute force is the law of the house, and in these cases it is often an arduous task to make the scholar feel the stress of a regulation or a command not seconded by a blow; but in almost every instance the authority of gentleness and kindness is at length acknowledged, and the spirits that are most turbulent at the outset are brought under rule.

We cannot but regard our schools as a police force of incalculable value. When we see children who at home never hear a kind word, and are surrounded by depraving influences, hanging about their teacher as the school is dismissed, waiting for her parting kiss, lingering till the doors are closed, as at the gates of the only paradise they know; when we find lessons of the highest moral and Christian wisdom, not dispensed in formal homilies, but blended with the school-work in song, question, and story; when we mark in the children, at successive stages of their education, a growing self-respect, as evinced in neatness, order, and propriety of deportment, — we are constrained to believe that not a few are thus rescued from the criminal and vicious classes of society, and prepared for industrious, sober, and virtuous lives, and for a much higher position than their parents occupy.

The High School has maintained its place as second to no public school of its grade in the Commonwealth, and as not inferior in its teaching capacity, and in the proficiency of those of its scholars who are fully capable of enjoying its privileges, to our best endowed academies. These last, if they can claim any superiority, owe it solely to the fact that they are select schools, and that they always rid themselves at an early period of incapable or refractory pupils. While the college examinations do ample credit to the classical department of the school, it merits

no less emphatic commendation as a seminary for those who are destined for business, or for the higher callings of practical life. At the same time, its course of study can hardly fail, except under the most unpropitious circumstances, to open the way, and cherish the ambition, for prolonged self-culture. When we consider that a large proportion of its pupils are from families that could not afford the expense of any thing beyond a primary-school education, and that it cannot cost the richest tax-payer who sends children to it a third part of what it would cost him to send his children to an inferior private school, we cannot but regard this portion of our school-tax as an economical and judicious investment. The school has lost in the course of the year the valuable services of Miss Brigham, the teacher of drawing, whose health failed under the physical strain made necessary by the very nature of her occupation. She has been succeeded by Mr. Dana, an artist by profession, whose skill and assiduity give the best assurance of the thoroughness and excellence of his work. Drawing is now made, as it should be, a voluntary exercise; and the instruction in this department will be sought, in great part, by those who expect to make it availing in pattern-drawing, or in the various arts in which the free use of the pencil is an essential qualification for a master-workman.

The Training School has, until the present year, had no school of a higher grade than the Primary in immediate connection with it. The needs of the children in its neighborhood suggested the formation of a Grammar-school class under the charge of an experienced and approved teacher of one of the previous Primary classes. The young ladies in the Training School have thus a wider range of observation and instruction, and may be prepared for Grammar-school as well as for Primary-school service. The pupils of the Training School are not only initiated in the routine of school-work, but the utmost care is bestowed on their moral qualifications for their office, especially on the cultivation of sentiments of forbearance and kindness, and of the corresponding habits of patience, gentleness of mien and manner, and watchful attention to whatever can affect the happiness or the character of the children under their charge. There are now in our schools graduates of the Training School

sufficiently numerous to furnish a fair test of its beneficent agency; and we believe, that, tried by this test, it cannot fail of the strong approbation and willing support of our successors on the School Board. With the principal it is pre-eminently a labor of love; and her watchful guardianship follows her pupils as they become teachers, and still resort to her for counsel and sympathy, feeling themselves always sustained by her cordial and efficient friendship.

The Evening Drawing Schools, though attended by less than the usual number of pupils, have been so conducted as to merit the unqualified approval of the Sub-Committee that has had them in charge.

The Evening Schools for Adults have fully maintained their former character, and are frequented by many who are sincerely solicitous to supplement the deficiencies of early education, and whose improvement attests the sincerity of their endeavor, and amply justifies the expenditure made for their benefit.

Of the Grammar and Primary Schools, we, of course, cannot speak in detail. They have fully sustained the deserved reputation of previous years. It is impossible to overestimate the services rendered them by our Superintendent, who keeps the whole field constantly in view, is fruitful in valuable suggestions, maintains a friendly intercourse with all the teachers, and is their referee in all difficult questions of organization, management, and discipline. He has done much, and is devising plans for doing more, in breaking up the monotony of class reading by introducing fresh reading-matter adapted to awaken interest in the pupils, and to test their capacity of reading at first sight, which, in the stereotyped method of studying the reading-lesson of the day, has hitherto received too little attention.

It is a subject for congratulation that we are, to so large an extent, realizing in this city the ideal of a *common*-school system. The number of scholars in private schools was probably never so small as now. In some of the Primary Schools, and in all the schools of a higher grade, a large proportion of the pupils are from families that would resort to private tuition, were there not a general confidence in the competency and efficiency of the public schools. There are in the latter some decided

educational advantages. A child of surpassing ability and diligence might, indeed, make more rapid progress where scholars can be classed by proficiency, without reference to time. Such children, however, can almost always secure at home the opportunity for reading, and the means of added instruction. But, for nine children out of ten, the system by which, from year to year, they pass from grade to grade through the ordeal of a faithful examination, furnishes an adequate stimulus; and the assigned school-work of every year, if well performed, is amply sufficient for the average boy or girl.

It may also be maintained, that in a city like ours, where the public schools are liberally supported, and carefully superintended, they will secure, in general, in the teachers, a higher order of ability and fitness than is to be found in private schools of corresponding grades. Not always, indeed. In almost every community, and certainly in our own, there are private teachers who hold for a series of years a just pre-eminence in their profession, and whose work, if not superior to that of the public schools, at least seems so, because wrought on more facile subjects for instruction. But the teachers of our public schools are generally chosen on the ground of known success, or of excellent promise, and chosen from a list of candidates whose claims have been considered and estimated — oftener than not tested by repeated service as substitutes — before the vacancy occurs; so that, without the form, they are elected virtually on the principle, of competitive examination. They thenceforth regard teaching as their sole business and their prime interest: they study it as an art and as a science; they keep themselves acquainted with its literature; and they avail themselves of every possible opportunity of visiting other schools than their own, of attending educational conventions, and of appropriating for their own benefit such practical wisdom as may have been elsewhere evolved from experience or experiment.

Our public schools are to be prized, also, for their relation to society and political life. Ours is the least homogeneous nation upon the earth; and, even in Massachusetts, a very large minority of the present inhabitants are of other than Anglo-Saxon parentage. Different races, with their contrasted cultures

and proclivities, can be fused only in childhood. Prejudices of nation, caste, and sect, if not then removed, are likely to be life-long. But children brought into friendly intercourse in their school-days, seated side by side in the class-room, and meeting on equal terms on the playground, can hardly fail to grow up with a good degree of mutual tolerance and appreciation, and, in very numerous cases, of respect and kindness; while, if trained apart, there would be between those of different races and creeds only dislike, distrust, and repugnancy. This tendency of our public schools is well understood by large numbers of their opposers. In the West, among the grave charges proffered against them is their tendency to obliterate race-distinctions, and to create a common nationality; and, in some cases, it has been demanded as a condition of peace, that, in a certain proportion of the schools, the English language should not be taught or spoken. In fine, there is no point of assault at which those hostile to republican institutions would be so confident of success as the public-school system. Let us learn its worth from its enemies, if its friends seem to exaggerate its value.

The Committees of former years have indicated improvements that might be made in the general plan of study for our schools. Some of these improvements have been inaugurated; others will, no doubt, receive due attention from future Boards. We need not be solicitous for speedy or rapid change, where, in the present, there is so much that claims our entire acquiescence and satisfaction. Far better is it, that, by careful forethought and deliberate action, we make sure that change shall never mean any thing else than improvement.

The Committee earnestly commend the schools to the interest, not only of their official guardians, but of the whole community, and especially of the municipal Council. It is of prime importance that the several Boards of control and government act in concert, and with mutual respect and confidence. The School Committee, consisting, for the most part, of men who would not and could not, under any conceivable circumstances, be candidates for any other public office, or for public patronage of any sort, can have no interest in view, except the improve-

ment and well-being of the schools; and they invite and claim the co-operation of the other municipal Boards, and of all good citizens, in the advancement of this essential aim and purpose.

All which is respectfully submitted.

ISAAC BRADFORD, *Chairman ex officio.*

ANDREW P. PEABODY,
EDWIN B. HALE,
JOHN L. HILDRETH,
EDWARD R. COGSWELL,
HENRY HINCKLEY,
JAMES H. HALL,
ALBERT L. NORRIS,
JOHN O'BRIEN,
GEORGE R. BRINE,
GEORGE R. LEAVITT,
JAMES A. DOW,
ASA P. MORSE,
PHILIP R. AMMIDON,
EDMUND H. STEVENS,

School Committee.

TABULAR VIEW

OF

THE PUBLIC SCHOOLS OF CAMBRIDGE,

JANUARY 1, 1877.

Name of School.	Teachers.	Salary.	No. of Scholars Jan. 1, 1877.
High School,	Lyman R. Williston . .	$3,600	423
	William F. Bradbury . .	2,750	
	John Orne, jun.	2,250	
	Theodore P. Adams. . .	2,250	
	Solon F. Whitney . . .	2,250	
	Charles G. Dana. . . .	900	
	Mary F. Peirce	1,100	
	Emma A. Scudder . . .	900	
	Hannah Gleason	900	
	Olive E. Fairbanks . . .	900	
	Emma F. Munroe . . .	900	
	Mary C. C. Goddard . .	900	
Allston Grammar,	Benjamin W. Roberts . .	2,250	498
	Lizzie B. Winnett . . .	800	
	Emily R. Pitkin	700	
	Lucia E. Whiting . . .	700	
	Hattie E. Keith	700	
	Hannah L. Hill	700	
	Henrietta Woods. . . .	700	
	Ida G. Smith	700	
	Minnie L. McKay . . .	700	
	Nettie Sargent	700	
	Caroline Close	700	
Harvard "	Aaron B. Magoun . . .	2,250	593
	H. Augusta Dodge . . .	800	
	Ada H. Wellington . . .	800	
	Mary E. Wyeth	700	
	Margaret B. Wellington .	700	
	Lydia S. King.	700	
	Susan F. Athearn . . .	700	
	Margaret R. Hodgkins. .	700	
	Annie M. Leland. . . .	700	
	Susan E. Merrill. . . .	700	
	Emily F. Damon . . .	700	
	Sarah E. Golden	700	
	Ellen Merrick	700	
	Sarah E. Dyer	700	
	Mary F. Emerson . . .	700	

TABULAR VIEW OF THE PUBLIC SCHOOLS. — *Continued.*

Name of School.	Teachers.	Salary.	No. of Scholars Jan. 1, 1877.
Putnam Grammar,	James S. Barrell	$2,250	410
	Sarah M. Burnham	800	
	Anna B. Josselyn	700	
	Addie Stone	700	
	Eliza M. Hussey	700	
	Ella R. Grieves	700	
	Augusta G. Miriek	700	
	Annie Knapp	700	
	Eliza S. Getchell	700	
	Maria E. Spare	700	
Shepard "	Daniel B. Wheeler	2,250	446
	Fannie A. Cooke	800	
	Julia H. Osgood	700	
	H. Estelle Varney	700	
	Sara J. Freneh	700	
	Sarah A. Rand	700	
	Harriet L. Hayward	700	
	Emily F. Fessenden	700	
	Cora M. Wheeler	700	
	Ruth E. Lander	700	
	Dana A. Evelyth	700	
Thorndike "	Ruel H. Fletcher	2,250	437
	Ellen N. Parker	800	
	Martha A. Martin	700	
	Mary E. Nason	700	
	Isabella B. Tenney	700	
	Ella W. Clark	700	
	Ruth H. Faxon	700	
	Grace W. Fletcher	700	
	Emma A. Hopkins	700	
	Abbie A. K. Howard	700	
	Lydia A. Whitcher	700	
Washington "	Daniel Mansfield	2,250	483
	Hattie T. Nealley	800	
	Lucy A. Downing	700	
	Adeline M. Ireson	700	
	Emma F. Veazie	700	
	Abby M. Webb	700	
	Adelaide A. Keeler	700	
	Adelaide A. Keith	700	
	Adelia Dunham	700	
	Emma P. Eaton	700	
	Aroline B. Meek	700	
	Eliza A. Hale	500	
Webster "	John D. Billings	2,250	565
	Gertrude E. Hale	800	
	Louise C. D. Harlow	700	
	Esther F. Hannum	700	
	May E. Towle	700	
	Gertrude A. Hyde	700	
	Charlotte M. Chase	700	
	Emily H. Phinney	700	
	Anna S. Lamson	700	
	Clara E. Matchett	700	
	Carrie M. Kingman	700	

TABULAR VIEW OF THE PUBLIC SCHOOLS. — *Continued.*

Name of School.	Teachers.	Salary.	No. of Scholars Jan. 1, 1877.
Webster Grammar,	Alice Grey	$600	
	Marion H. Burnham	700	
Boardman Primary,	Mary Agnes Lewis	700	276
	Sarah E. Stewart	700	
	Augusta L. Balch	700	
	S. N. Chamberlain	700	
	Eliza A. Dow	700	
	Carrie A. Cooke	700	
Brattle "	Lucy C. Wyeth	700	45
Bridge "	Elizabeth E. Dallinger	700	81
	Emily C. Dallinger	700	
Dana "	Abby A. Lewis	700	103
	Maria F. Williams	700	
Dunster "	Sarah B. Waitt	700	71
	Susan E. Wyeth	700	
Felton "	Georgiana L. Backus	700	150
	Sarah L. Cutler	700	
	Eliza J. Cutler	700	
Gannett "	Sarah J. A. Davis	700	175
	Estelle J. French	700	
	Anna M. Jones	700	
	Charlotte E. Mitchell	700	
Gore "	Harriet A. Butler	700	422
	Frances E. Pendexter	700	
	Alice J. Winward	700	
	Mary E. Hartwell	700	
	Addie M. Bettinson	700	
	Agnes M. Cox	700	
	Mary A. Bourne	700	
	Nellie L. Pike	600	
Harvard "	Ellen A. Cheney	700	95
	Helen M. Ward	700	
Holmes "	Marianne M. Webb	700	221
	Eunice W. Field	700	
	Mary L. Bullard	700	
	Louisa G. Matchett	700	
Mason "	M. Lizzie Evans	700	108
	Alma A. Smith	700	
Otis "	Abby S. Taylor	700	416
	Martha H. Butler	700	
	Ellen N. Pike	700	
	Luvia Goodnow	700	
	Kate F. Wellington	700	
	Carrie H. Smith	700	
	Mary E. Smallidge	700	
	Fannie Allen	700	
Putnam "	Nellie F. Ball	700	59
Quincy "	Charlotte E. Jewell	700	99
	Talulah G. Abercrombie	700	
Reed "	Lucy T. Sawyer	700	125
	Evelyn A. Sawyer	700	
	Hattie N. Keyes	700	
Riverside "	Elizabeth A. Tower	700	212
	M. Louise Akerman	700	
	Adah W. Baker	700	

TABULAR VIEW OF THE PUBLIC SCHOOLS — *Continued.*

Name of School.	Teachers.	Salary.	No. of Scholars Jan. 1, 1877.
Riverside Primary,	Florence M. Hayward . .	$600	
Sargent "	Frances J. Harrod . . .	700	167
	Mary A. Brown	700	
	M. Elizabeth Dickson . .	700	
	Lizzie C. Capen	700	
Willard "	Mary Ann Tarbell . . .	700	435
	Mary E. Sawyer	700	
	Kate M. Lowell	700	
	Fanny E. Cooke	700	
	Amelia Wright	700	
	H. Flora Hannum . . .	700	
	Evelina Brooks	700	
	Laura Wright.	700	
	Grace R. Woodward . .	700	
	Louise W. Harris . . .	600	
Wyman "	Fannie E. M. Dennis . .	700	189
	Charlotte A. Ewell . . .	700	
	Letitia M. Dennis . . .	700	
	Martha C. Dickman . .	700	
Training School,	Anna C. Sullivan . . .	950	173
	Ella C. Whitney	700	
	M. Etta Arkerson . . .	700	
	Emma B. Alley	700	
	Jeanie Prescott	700	
City "	Jeanie A. Norris	800	77
	Nellie A. Hutchins . . .	700	

TEACHER OF SINGING. — Nathan Lincoln $2,250
SUPERINTENDENT OF SCHOOLS. — Francis Cogswell 2,800
SUPERVISOR OF DRAWING. — Emma F. Bowler 800

SUMMARY.

Number of Pupils in High School	423
" " " " Grammar Schools.	3,462
" " " " Primary Schools	3,669
	7,554

COST OF INSTRUCTION.

High School	$19,600	. . . . . for each pupil,	$46.34
Grammar Schools	68,750	. . . . . " " "	19.86
Primary Schools	56,050	. . . . . " " "	15.28
Music	2,250		
Drawing.	800		
Salary of Superintendent	2,800		
	$150,250	. . . . . for each pupil,	$19.89

Number of Pupils belonging to Public Schools, Jan. 1, 1877	7,554
" " " " " " " Jan. 1, 1876	7,548
Increase during the last year	6
Average annual increase of Pupils from 1860 to 1874 inclusive	246
Decrease of Pupils, 1875	268
Increase " " 1876	6
Number of Schools	29
" " Teachers	176

REPORT

ON THE

SANITARY CONDITION OF THE SCHOOLHOUSES.

THE Committee to whom was referred the following order, dated Sept. 9, 1875, — "That the Committee on Public Property be requested to provide suitable ventilation for the Willard Primary Schoolhouse," with instructions to report on the sanitary condition of the schoolhouses of Cambridge, — have attended to their duty, and submit the following

REPORT.

No one can doubt the importance of the subject which your Committee were directed to consider. It is one which interests everybody. Nearly all our children of proper age are, at one time or another, in the public schools, and the authority which provides for their education is bound by every consideration of justice, as well as self-interest, to see to it that those whose minds it cultivates are not injured physically by any neglect on its part, and it is plain that hygienic laws cannot be constantly violated in schoolhouses where hundreds of children spend so many hours daily, without causing serious apprehensions of evil in the mind of every intelligent person.

Taking the city as a whole, at all times the number of children who are kept from school by sickness of greater or less severity is large.

To be sure, we cannot say positively how much of this sickness is caused by the insanitary condition of the schools, but those circumstances which contribute to such a condition — viz., foul air, too much or too little heat, bad drainage, &c. — weaken the constitution, and render it less able to resist dis-

ease, and must in many cases result in sickness, and perhaps in death.

As soon as the Committee was organized, steps were taken towards a thorough inspection of the various schoolhouses, each member having assigned him for examination a certain number of buildings, and in those cases where the most serious defects were reported, or where any real or supposed advantages were found, visits were made by the whole Committee.

For the purpose of informing themselves in regard to what has been done by others in attempting to improve the sanitary condition of schoolhouses, the Committee also visited the following schoolhouses in Boston ; viz., the Lawrence and Dudley Grammar, the Girls' High, the new buildings for the Newbury-street Primary, and the Winthrop Grammar Schools, and also the Chauncy Hall Private School, as well as the Lawrence School in Brookline.

They also communicated with certain gentlemen who have made a special study of the subject, from whom they have received valuable assistance.

At the visits made to our own schools, attention was particularly given to the amount of space allowed to each pupil, the means and amount of ventilation, the method of warming, the arrangement of the desks with regard to the light, and to the drainage, including, under the latter head, the situation and condition of the water-closets and urinals.

The results of these visits of inspection are summarized in the tables appended to this Report.

So far as your Committee are informed, no Report of a similar character has ever been presented to this Board; nor has any especial attention, with very few exceptions, been given to this subject by those charged with the erection and care of our schoolhouses. No doubt they have honestly striven to provide the best accommodations, and in many respects they have succeeded ; but owing to the ignorance of the hygienic requirements of such buildings on the part of architects, or their neglect of what would not attract the attention of the ordinary observer, opportunities have been lost, and mistakes made, which can only be remedied at great cost.

The subjects of warming and ventilation are so intimately connected, that they can only be satisfactorily treated together.

In arranging the heating-apparatus, "the object aimed at should be to introduce a large volume of air moderately heated, rather than a small quantity at an excessively high temperature."[1] This may be done in various ways; but under no circumstances should direct radiation be exclusively employed, either from coils of steam-pipe, or from stoves.

Every scholar, of whatever age, should have, to begin with, from two to three hundred cubic feet of space; and not less than ten, and if possible fifteen, cubic feet of air should be furnished him per minute. Some good authorities put the amount required every minute much higher; for, in consequence of the law of the diffusion of gases, "ventilation is a process of diluting a confined foul air by renewal with pure air, and requires, therefore, for its complete performance, much larger quantities of fresh air than if one could be directly substituted for the other." "When this dilution is thoroughly done without injurious derangement of temperature, or production of local draughts, we have good ventilation."[2]

These remarks have a practical bearing on the question of the proper size of schoolhouses; for "adequate ventilation and satisfactory heating can be more easily secured in buildings of moderate size than in very large ones."

"The same may be said in regard to the sewerage, and exposure to the sunlight."[2]

It should be borne in mind, that, excepting those cases in which fans or other machinery are used to move the air, all so-called "systems" of ventilation depend for their efficacy upon the rarefying of the air in some way or other by heat; and your Committee believe that every schoolhouse should have an air-shaft of sufficient capacity to withdraw all foul air from the building, and that the column of air in the shaft should at all times be heated. This heating of the shaft can be very easily accomplished in winter by constructing the smoke-flue of the heating-apparatus within it; but provision should be made for heating it at all other times by a stove.

At least ten square inches of outlet for each scholar should be made into this shaft; and, if there is danger lest the ventila-

[1] Dr. Kedzie's Report to Michigan Board of Health, 1874.
[2] Dr. Kedzie.

tion of upper rooms should be inferior to that of those below, the openings from the rooms above should be made larger. The fresh air should be admitted through openings of equal size to those provided for the discharge of foul air; and it should be warmed only by passing over coils of steam or hot-water pipes in the basement of the building, or else by furnaces in those schoolhouses where the expense of boilers, &c., would be disproportionately large.

It was the desire of the Committee that analyses of the air from some of our schoolrooms should be made, to test the amount of carbonic acid contained therein, the quantity of this gas present being considered as a fair indication of the total amount of impurity in the air; but they found that such analyses would involve an expense greater than they cared to bear themselves, and which they had no authority to incur on behalf of the city. In judging of the condition of the air, therefore, in the several rooms, they were forced to rely upon their own sensations; but they feel the more confident in trusting to this source of information, for, while the presence of small amounts of carbonic acid is not apparent to the sense of smell, it is no doubt true, as a writer in the Report of our State Board of Health for 1871 puts it, "that no surer or more exact test than a well-educated nose has as yet been discovered with which to measure the amount of vitiating animal matter in the air."

In their visits to the schools, the Committee found the air of many of the rooms to be very close and foul, and, in some cases, to an excessive degree. In some rooms, upon entering, or while seated upon the platform, little odor was perceived; while in the centre of the room the air was exceedingly offensive.

With few exceptions, the teachers were unanimous in saying that they were obliged to depend in a great measure upon opening the windows for the ventilation of their rooms, and this the Committee believe to be true; but they feel compelled to say that they were very much surprised at the inability of many teachers to avail themselves of the limited means of ventilation provided, by reason of their ignorance of the simplest principles which govern the movement of air. This was true of teachers whose high position and presumably large attainments would lead us to expect a different result.

The conflict which sometimes exists between teachers and janitors is another source of difficulty. The janitor's only object is to warm the building to the required degree of temperature, regardless of the character of the air, and, ignorant of the greater ease of doing this with fresh air than with foul, as soon as the teacher's back is turned, all the openings communicating with the outer air are closed, while the teacher undoes the janitor's work by opening indiscriminately the registers at the top and bottom of the room. In order to give satisfaction, any system, however well planned, ought to be under the control of one pair of hands, directed by at least an average amount of brains.

By our tables, it appears, that, in the Grammar Schools, the average amount of air-space to each scholar is one hundred and seventy-five cubic feet; the Harvard School having the largest, two hundred and eleven feet; and the Putnam the smallest, one hundred and forty-five feet. In the Primaries, it ranges from two hundred and twenty-eight in the Mason, and two hundred and twenty-five in the Agassiz, to one hundred and twenty in the Bridge, and ninety-one in the branch of the Gannett School, giving an average of one hundred and sixty-one cubic feet. These amounts, it should be remembered, are in practice diminished by the space occupied by the seats, desks, and other furniture of the room.

The Shepard Grammar School, in Ward Five, which was remodelled a few years since, is the only building which has a central shaft heated by a smoke-flue. The upward current in the shaft is strong; but, by what your Committee must regard as a serious error, the total area of the inlets for fresh air in each room is but two hundred and fifty-six square inches, while the area of the outlet is four hundred and thirty-two square inches. Without an adequate supply of air, such a shaft cannot do its proper work: with a strong heat, a downward current will often be established in the shaft to compensate for the insufficient air-supply. This fault might be remedied at a comparatively small expense. The Committee recommend for this building, that an opening be made into the shaft from the entry-way, to air the hall, and, indirectly, the clothes-rooms, and that a stove be placed at the bottom of the shaft for use at all times when there is no fire under the boiler.

The Harvard Grammar School, in Ward Two, is warmed by indirect radiation from coils of steam-pipe in the cellar, and the Thorndike, in Ward Three, by furnaces; but both are ventilated by a patented arrangement of metal tubes, ten inches in diameter, extending from the bottom of each room to a common opening on the roof, in which tubes a current is obtained by allowing the warm air of the room, which escapes through an opening near the ceiling, to pass round them in its passage to the outer air. On the day of the Committee's visit to the Harvard School, the velocity of the current in one of the shafts on the lower floor, as measured by a Casella's anemometer, was a little more than four feet per second, which would give a supply of air of one hundred and thirty cubic feet per minute, or 2.6 feet to each scholar, and change the whole air of the room rather more than twice in a morning session.[1]

The air in the Harvard School is superior to that in most other schoolhouses, and better even than that in the Thorndike: this is probably owing, in great part, to the fact that the amount of space allowed to each scholar is above the average, and to the custom of always keeping open the doors between the rooms and the spacious entries, and thereby insuring a better diffusion of the air.

The larger part of the Putnam Grammar School, in Ward Three, has practically no other means of ventilation than by the windows.

Some of the rooms have openings over the doors into a long and narrow entry, through which the air circulates feebly, if at all, and others have registers in the ceiling supposed to connect with shafts leading to the roof; but the Committee have been told that some of these were entirely cut off some years since, when the third story was finished. The building needs an entire remodelling in the interests of health, convenience, and safety from fire: when this is done, a plan for thorough ventilation may be tried with hope of complete success.

The Allston, Webster, and Washington Schools have all been remodelled within a few years, to the great advantage and convenience of both teachers and scholars in many respects; but

[1] As the room has two shafts, the actual quantity of air passing out of the room was about double the amount above mentioned.

they all depend for ventilation upon small shafts, sometimes in the outer brick walls, and all without heat. The same remarks apply to the ventilation of most of the Primary Schools as to these last-mentioned Grammar Schools. These shafts are often rough on the inside, whereby the movement of the air through them is greatly retarded by friction; and in some cases, where they are made of wood, the boards shrink, and the air rushes from the outside through the cracks, and thereby cuts off much of the current of foul air from the rooms.

Nearly all of them are too small. In such cases, the windows are the chief reliance.

The Agassiz School has the same arrangement spoken of above in connection with the Harvard and Thorndike Schools.

The Harvard and Mason Primaries have no outlets whatever; and those in the Riverside School, on Putnam Avenue, terminate in the attic. This last should be changed at once by making an outlet above the roof.

It is hard to decide what should be done for the Harvard, until that time (probably not far distant) when the building will need remodelling to accommodate an increased number of scholars, or a new building will take its place. So, also, with the Mason.

The Bridge Primary, on Pioneer Street, contains but one room, with two teachers and about eighty scholars. It is the poorest building used by the city for school-purposes. It is warmed by a stove; and, although there is an outlet in the ceiling, no provision is made for the admission of fresh air. Your Committee recommend that a casing of sheet iron be put round the stove, at a distance of one foot from it, and that air be admitted from without, between the stove and casing, by a cold-air duct under the floor. This plan is highly recommended for such buildings, as furnishing a supply of air, and preventing the too great radiation of heat immediately around the stove.

The most crying evil, however, is that which the Committee were especially directed to consider; viz., the case of the Willard Primary Schoolhouse, in Ward Four.

This three-storied building of twelve rooms, intended to accommodate five hundred and sixty scholars, and now occupied by eleven teachers and their classes, numbering four hundred and

eighty-nine children, is warmed by two steam-radiators in each room, with no opportunity for the entrance of fresh air, except by openings over the doors leading into the entries; and these openings themselves are tightly fastened up in winter, on account of the insufficiency of the heating-apparatus to warm the building when they are open.

Ever since the building was occupied, complaints have been made of its condition, and the case is one which demands attention at once. The Committee recommend that the plan of warming be entirely changed; that the radiators be removed from the rooms, and coils of pipe be placed in the basement, over which a proper amount of fresh air can pass, and be conducted to the rooms by pipes of large size. In place of the present system of wooden foul-air ducts, there should be a large shaft on each side of the entry, subdivided, if necessary, above the basement by thin partitions, and warmed in winter by a large coil of steam-pipes in the bottom. That part of these shafts which is in the cellar should be of brick, which will allow stoves to be put into them for summer use, without danger from fire.

The Willard is the only three-storied building in the city intended for the exclusive occupation of Primary scholars.

The Committee believe very strongly that no Primary Schoolhouse should be more than two stories in height, and they rejoice at the recent action of the Board in declining to recommend the finishing of the third story of the Gore Primary School. Among the reasons for this opinion, the greatly increased danger in case of fire is one of the most important; and the Committee recommend that steps be taken to provide fire-escapes for the Willard Schoolhouse.

The Putnam Grammar School, which from its faulty plan is particularly liable to danger from this source, has a fire-escape consisting of an iron staircase leading from a window of one of the rooms on the second floor.

A room at No. 327½ Cambridge Street has been used for some time by one class of the Gannett Primary School: it was hired originally to meet a supposed temporary emergency, and only intended to accommodate a few scholars; but, owing to the unexpected increase of applicants for admission, it was fitted up with seats, and has of late contained more than sixty scholars.

It is totally unfit for its present use; and your Committee recommend that it be immediately given up, and the scholars removed to the main building on Columbia Street. They understand that this can be done by transferring some of the scholars now belonging to the Gannett to the Sargent and Felton Schools.

To remedy the difficulty heretofore experienced in warming the Gore Primary, in Ward Three, the Committee recommend that a radiator be put into each room as a supplementary source of heat, to be used only in very cold weather: as provision is already made for the admission of fresh air, it is thought that the use of such a radiator will not be objectionable.

From what has already been said, it appears, that, in a large majority of our schoolhouses, we must depend in a great measure, if not wholly, upon the windows; and it therefore becomes necessary to see that the danger of cold currents of air be avoided as much as possible. The Committee believe that the best results will be obtained by the use of inclined boards fitted into the window-frame at such an angle, that, when the upper sash is lowered, the incoming air will be deflected upwards, and, by striking the ceiling, be well diffused over the room before descending. This is the plan recommended in an essay published by the Massachusetts Medical Society in 1871.

Mr. P. Mihan of Cambridge has recently taken out a patent for a window-ventilator, which embodies this idea, but also contains some additions to the simple board, designed to still further prevent any annoyance to those sitting near the window. As these additions seem to be real improvements, the Committee advise that Mihan's window-ventilators be adopted for two windows in each room of the following schools; viz., Washington, Webster, Allston, and Putnam Grammar, Reed Street, Wyman, Dunster, Holmes, Quincy, Riverside, Dana, Felton, Boardman, Sargent, Gannett, Bridge, Otis, and Gore Primaries; also for four windows in each room of the Harvard and Mason Primaries.

The High School contains nine rooms, exclusive of Mr. Orne's room, and that occupied by the classes in drawing: one of these nine affords nine hundred and sixty cubic feet of space per scholar, and the others an average of three hundred and twenty-five.

The building is heated mainly by direct radiation from steam-pipes running around the sides of the rooms; but a part of the rooms, including the one recently fitted up in the basement, are provided with fresh air from without. One of the ventilating-ducts is warmed by the smoke-flue of the boiler: the others are not warmed. The boiler now in use is not of sufficient capacity to perform the work required of it.

Unless the whole building should be materially altered, the Committee see no means of effecting a radical improvement; but, in view of the possible future enlargement of the building, they recommend the putting in of a boiler or boilers of sufficient size, and the use, in all the rooms, of the window-ventilators mentioned above.

It would be a great advantage to those rooms which now are unprovided with fresh-air inlets if openings could be made in the outer walls, and radiators placed against them, as is now done in the Shepard Grammar School. The expense of these inlets would be about twenty-five dollars each: of the cost of the radiators and connecting-pipes the Committee are not informed.

None of our schoolhouses are cut off by their position from an abundance of light; but the proper use of it is an important matter.

The light should fall on the scholar's desk from the left side, or from behind, and never from the front. The Committee noticed in the Harvard Grammar School, that in some rooms, especially those in the third story, the sun's rays shone directly across the desks, and in the faces of the children. By re-arranging the desks and platform, this might be avoided; and your Committee recommend strongly that this be done, not only in this school, but in all others where a like condition of affairs exists. In the rear room of the Harvard Primary School, there are two windows over the teacher's platform, which the children are obliged to face.

As these windows are on the north side of the building, they are not exposed to the direct rays of the sun; but it is recommended that curtains be provided, in addition to the outside blinds, for use when the closing of the latter would render the room very dark.

When water-closets and urinals are placed in the cellar of a schoolhouse, it is a difficult matter to prevent their becoming nuisances; and, from the experience of our own schools where this arrangement exists, your Committee do not feel warranted in recommending its adoption, except in those cases where the most thorough ventilation can be secured, and the best of care taken to enforce cleanliness, especially of the urinals. These last should always be made of slate, which is far preferable to metal or even ordinary flagstones, and provided with an abundant supply of running water at all times when they are likely to be in use. The Committee recommend that the boys' water-closets and urinals of the Gore Primary School be removed to the yard, and a covered latticed way be built between them and the schoolhouse. Notwithstanding the elaborate attempts which have been made to ventilate them in their present position, the result is not considered satisfactory and safe by the Committee. In this case, as well as in the Thorndike, Allston, Shepard, and Washington Grammar Schools, it is recommended that what are known as "school sinks" be built in the yard. These "school sinks" are long troughs of brick with round bottoms, supplied with water for flushing at one end, and connected at the other with a cesspool, and from thence to the sewer. They are similar in form to those now in the cellar of the Harvard Grammar School: these last are ventilated by a short pipe of large diameter leading directly into the chimney, and are said not to be offensive at any time.

The Thorndike School "sink" should be so built as to obviate the difficulty which is now experienced in making water run up hill. By connecting it with a sewer at a lower level than the one now in use, it is believed that this may be done.

Finally, all janitors should be furnished with a sufficient quantity of disinfectants, and required not only to use them freely, but also to pay especial attention to the cleanliness of every part of the water-closets and urinals inside or outside the building.

The Committee have not considered one important subject; viz., whether the shape, height, and proportions of our present seats and desks are in all respects what they should be; but they desire to call attention to what they believe to be some advan-

tages in a new form of desk and chair used in the Chauncy Hall School. The back of the chair, instead of being hollow, as in those which we use, is rounded to fit and support the back without throwing forward the shoulders, while one-half of the lid of the desk is hinged to the other, so that it can be raised at an angle of about 45° with the floor, and then furnishes a support for a book, either large or small, and renders it unnecessary for the scholar to lean over his desk.

The Committee hope that no new schoolhouse will be built, nor any extensive alterations of old ones be undertaken, without the most careful attention being paid to the subjects discussed in this report; viz., warmth, ventilation, light, drainage, and shape and arrangement of seats and desks.

If this Report contributes in any degree to such a result, they will feel that their labors have not been in vain.

J. L. HILDRETH,
A. L. NORRIS,
JAS. A. DOW,
EDWARD R. COGSWELL,
} *Committee.*

CAMBRIDGE, March 2, 1876.

TABULAR VIEW OF THE PUBLIC SCHOOL-BUILDINGS OF CAMBRIDGE.

Name of School.	Material.	When Built.	No. of Rooms.	No. of Rooms on a Floor.	No. of Desks.	No. of Cubic Feet per Desk.	Method of Warming.	Light and Drainage.	Method of Ventilation.
High School,	B.	1864.	9	3	435	1 room, 960; average of others, 325.	Partly by direct radiation, and partly by both direct and indirect combined.	Water-closets and urinals in basement.	Shafts 12x12 inches, only one of which is heated. The largest room has an opening for ventilation in the ceiling.
Shepard Grammar,	B.	1856. Remod'l'd 1873.	12	4	40 to 54 in each room.	Average, 204.	Steam-radiators with openings in walls opposite them.	Privies in yard.	Central shaft 6′x5′; heated by smoke-flue of boiler.
Washington Grammar,	B.	1852. Remod l'd 1871.	12	4	11 rooms have 49 each, and 1 room has 42.	Average, 158.	Hot-air furnaces.	Boys' privy in yard. Girls have "school-sink" in cellar.	Small shafts not heated: each room has two with openings at top and bottom.
Harvard Grammar,	B.	1871.	15	6 and 3	Average, 48.	183 to 218.	Indirect radiation.	School-sinks in cellar.	Mihan's iron tubes. (See page 251 of report.)
Webster Grammar,	B.	1852. Remod'l'd 1873.	12	4	Average, 49.	Average, 165.	Furnaces.	Water-closets in cellar.	Wooden shaft in each room, with openings at the top and bottom.
Allston Grammar,	B.	1858. Remod'l d 1873.	12	4	Average, 49.	Average, 163.	Furnaces.	Privies in the yard.	Shafts 10″x12″; some in outer walls, and some in inner.
Thorndike Grammar,	B.	1859. Remod'l'd 1875.	12	4	Average, 47.	178.	Furnaces.	Privies in the yard. Drainage bad.	Mihan's. (See page 251.)
Putnam Grammar,	B.	1847.	9, and 3 class-rooms.	4	100 in large room, average in other rooms, 52.	Average, 145.	Furnaces.	Privies in the yard.	Almost none. (See page 251 of this report.)
Bridge Primary,	W.	*	1	1	79	120	Stove.	Privies in the yard. Cellar damp.	Ventilating register in ceiling. No fresh air supply.
Sargent Primary,	W.	*	4	2	Average, 49.	121	Furnaces.	Privies in the yard.	Two triangular wooden shafts in corners of each room.

Harvard Primary,	W.	*	2	2	Average, 60.	Average, 172.	Furnaces.	Privies in yard. Windows in front of scholars in the rear room.	Windows only.
Mason Primary.	W.	*	2	1	Average, 60.	Average, 228.	Furnaces.	Privies in yard.	Windows only.
Dunster Primary.	W.	*	4	2	50	139	Furnaces.	Privies in yard.	Shafts in corners of the rooms.
Dana Primary,	W.	1847.	2	1	Average, 55.	Average, 188.	Furnaces.	Privies in yard.	Each room has a wooden shaft 10″x12″.
Felton Primary,	B.	1847.	3, and 1 class-room.	2 on lower floor, and 1 on upper.	Average, 78.	Average, 160; class-room 90.	Furnaces.	Privies in yard.	Each room has a wooden shaft about 16″x16″.
Quincy Primary,	B.	1866.	2	1	Average, 56.	Average, 216.	Furnaces.	Privies in yard.	Small wooden shaft in each room.
Otis Primary,	B.		8	4	Average, 54.	150	Furnaces.	Privies in yard.	Small shafts.
Gannett Primary,	W.		4	2	Average, 50.	Average, 129.	Furnaces.	Privies in yard.	Each room has a ventilator 8″x8″ square.
Branch of above.			1		60	91	Stove.	(See page 253	of this report.)
Riverside Primary,	W.	1868.	4	2	Average, 56.	Average, 154.	Furnaces.	Privies in yard.	Ventilating ducts all end in attic.
Boardman Primary,	B.	1868.	8	4	56	Average, 165.	Furnaces.	Privies in yard.	Each room has a ventilating flue in outer brick wall measuring 10″x18″ or 8″x18″.
Reed Street Primary,	W.	1868.	4	2	Average, 56.	Average, 166.	Furnaces; 2 registers in a room.	Privies in yard.	Small shaft in each room.
Holmes Primary,	W.	1870.	4	2	Average, 56.	Average, 161.	Furnaces; 2 registers in each room.	Privies in yard.	Small shaft in each room.
Willard Primary,	B.	1870.	12	4	Average, 51.	Average, 170.	Direct radiation from steam-radiators.	Privies in yard.	Wooden shaft 16″x18″ in each room. No fresh air supply.
Wyman Primary,	W.	1871.	4	2	Average, 56.	Average, 174.	Furnaces.	Privies in yard.	Small shaft in each room.
Gore Primary,	B.	1871.	8	4	54	155	Indirect radiation from steam-pipes.	Water-closets in cellar.	Shaft in each room. Mihan's system for water-closets.
Agassiz Primary and Training School,	B.	1875.	8	4	Primary rooms, 42; Training class, 20	Average, 225. 652	Furnaces.	School-sinks in cellar.	Mihan's. (See page 252 of report.)

* Built by the *town* of Cambridge before 1847. Dunster remodelled 1871, and Sargent in 1874.

REPORT

OF THE

SUPERINTENDENT OF SCHOOLS.

To the School Committee of Cambridge.

Gentlemen, — I respectfully submit the following as my Report for the year ending Dec. 31, 1876, it being my Second Annual Report.

SUMMARY OF STATISTICS

FOR THE SCHOOL-YEAR ENDING DEC. 31, 1876.

I. POPULATION.

Population of Cambridge by State census for 1875	47,838
Number of children in the city between five and fifteen years of age, May 1, 1876	8,218
Increase for the year	90

II. SCHOOLS.

1 High School.	1 Training School.
7 Grammar Schools.	6 Evening Schools.
20 Primary Schools.	2 Evening Drawing Schools.
Whole number of Day and Evening Schools	37

III. SCHOOLHOUSES.

For the High School	1
For the Grammar Schools	7
For the Primary Schools, including Training School	18

IV. TEACHERS.

Number of teachers in High School	12
Male teachers, 5; female teachers, 7.	
Number of teachers in Grammar Schools	84
Male teachers, 7; female teachers, 77; decrease for the year, 4.	
Number of teachers in Primary Schools, including principal of Training School	78
Decrease for the year, 5.	

Number of teachers in Evening Schools	43
Male teachers, 6 ; female teachers, 37 ; decrease for the year, 6.	
Number of teachers in Evening Drawing Schools	2
Whole number of teachers in Day Schools, including teacher of Music and teacher of Drawing	176

V. PUPILS.

Whole number of different pupils registered in the Day Schools during the year	9,523
Average whole number of pupils belonging to the Day Schools during the year	7,066
Ratio of the average whole number of pupils belonging to the Schools to the population of the city	.147
Ratio of the average whole number of pupils belonging to the Schools to the school population	.859
Ratio of the average whole number of pupils between five and fifteen years of age, belonging to the Schools, to the school population	.801
Average daily attendance of pupils in all the Day Schools	6,492
Average per cent of attendance in all the Day Schools	91.8
Average whole number of pupils belonging to the High School	385
Average daily attendance in High School	360
Per cent of attendance in High School	93.6
Average whole number of pupils belonging to Grammar Schools	3,210
Average daily attendance of pupils in Grammar Schools	2,978
Per cent of attendance in Grammar Schools	92.7
Average whole number of pupils belonging to Primary Schools	3,459
Average daily attendance in Primary Schools	3,141
Per cent of attendance in Primary Schools	90.8
Whole number of different pupils belonging to Evening Schools, to January, 1877	682
Average attendance in Evening Schools, to January, 1877	306
Whole number of different pupils belonging to Evening Drawing Schools, to January, 1877.	114
Average attendance in Evening Drawing Schools, to January, 1877	64
Number of pupils over fifteen years of age in the Day Schools, May, 1876	482
Number of pupils under six years of age in the Day Schools, May, 1876.	582
Number of pupils graduated from Primary Schools, July, 1876	785
Number of pupils graduated from Grammar Schools, July, 1876	187
Number of pupils graduated from High School, July, 1876	45
Number of pupils graduated from Training School, July, 1876	13
Number of pupils admitted to Grammar Schools, September, 1876	737
Number of pupils admitted to High School, September, 1876	146
Number of pupils admitted to Training School, September, 1876	9
Whole number of Private Schools	17
Number of pupils in Private Schools	1,187

TABLE SHOWING THE NUMBER IN EACH COURSE IN THE HIGH SCHOOL, DECEMBER, 1876

Year.	Classical Course.	Complete English.	Shorter English.	Number of Divisions.
Fifth	20	. .	. .	1
Fourth	22	36	. .	2
Third	32	57	6	4
Second	89		20	5
First	121		20	6

TABLE SHOWING THE NUMBER IN EACH CLASS IN THE HIGH SCHOOL, DECEMBER, 1876.

Year.	Boys.	Girls.	Total.	Per Cent.
Fifth	20	. .	20	.047
Fourth	24	34	58	.137
Third	44	51	95	.224
Second	43	66	109	.257
First	75	66	141	.333
Total	206	217	423	

TABLE SHOWING THE NUMBER IN EACH CLASS IN THE GRAMMAR SCHOOLS, DECEMBER, 1876.

[The numbers in this and the following table include only those scholars who were present at some session during the first two weeks of December; while those in the "Tabular View" include all who belonged to the schools, though absent on account of sickness or for other cause.]

Class.	Boys.	Girls.	Total.	Per Cent.
First	121	141	262	.076
Second	175	178	353	.102
Third	268	256	524	.152
Fourth	387	387	774	.225
Fifth	354	352	706	.205
Sixth	435	386	821	.238
Total	1740	1700	3440	

TABLE SHOWING THE NUMBER IN EACH CLASS IN THE PRIMARY SCHOOLS, DECEMBER, 1876.

Class.	Boys.	Girls.	Total.	Per Cent.
First	464	534	998	.289
Second	516	550	1066	.309
Third	744	637	1381	.40
Total	1724	1721	3445	

The statutes require that "the School Committee shall annually, in the month of May, ascertain, or cause to be ascertained, the names and ages of all persons belonging to their respective towns and cities on the first day of May, between the ages of five and fifteen years, and make a record thereof."

The following is a summary of the returns made by the officers appointed to ascertain the required facts: —

MAY 1, 1876.	Ward 1.	Ward 2.	Ward 3.	Ward 4.	Ward 5.	Total.
No. of children in the city between 5 and 15 years of age	1348	2164	1666	2048	992	8218
No. in public schools between 5 and 15 years of age	1042	1693	1518	1657	871	6781
No. in private schools between 5 and 15 years of age	192	283	5	247	28	755
No. not attending school between 5 and 15 years of age	114	188	143	144	93	682
No. not attending school between 5 and 8 years of age.	81	123	77	92	35	408
No. not attending school between 8 and 13 years of age	13	30	13	24	23	103
No. not attending school between 13 and 15 years of age	20	35	53	28	35	171

VI. FINANCES.

Cost of instruction in the Public Schools	$159.318 00
Care and repairs of schoolhouses	32,052 43
Amount expended for new schoolhouses and alterations	1,636 50
Cost of instruction in Evening Schools and in Evening Drawing Schools	5,881 50

Furniture and apparatus for Evening Schools and for Evening Drawing Schools	$2,126 47
Amount of the salaries of truant officers	5,500 00
Incidental expenses for school purposes	4,023 66
Total expenditures for all school purposes	210,538 56
Deducting the receipts from the Hopkins Fund ($920.51), actual expenses for school purposes	209,618 05
Assessed value of real and personal estate, May, 1876	62,636,453 00
Ratio of expenses for school purposes to the valuation of 1876	.0033

SCHOOL ACCOMMODATIONS.

The following tables show the number of schoolhouses, and their estimated value, not including the value of the school furniture; the size of the school-lots, and the appraised value of the same; the number of sittings in rooms supplied with furniture (including unoccupied rooms); and the number of pupils belonging to each school at the close of the autumn term.

HIGH SCHOOL AND GRAMMAR SCHOOLS.

Schoolhouses.	Estimated Value of Houses.	Size of Lots. Square Feet.	Appraised Value of Lots.	Number of Sittings.	Number of Pupils.
High School	$35,000	37,824	$18,900	450	423
Allston	33,000	15,152	7,500	584	498
Harvard	50,000	20,678	10,300	714	593
Putnam	20,000	10,000	10,000	471	410
Shepard	33,000	14,807	7,400	556	446
Thorndike	33,000	10,000	7,000	514	437
Washington	28,000	14,489	14,489	532	483
Webster	33,000	25,765	12,700	579	565
Total	$230,000	110,871	$69,389	3,950	3,432

	Allston.	Harvard.	Shepard.	Thorndike.	Washington.
No. of furnished rooms unoccupied	..	2	1	1	..
No. of rooms unfurnished	2	1	..	1	1

PRIMARY SCHOOLS.

Schoolhouses.	Estimated Value of Houses.	Size of Lots. Square Feet.	Appraised Value of Lots.	Number of Sittings.	Number of Pupils.
Agassiz	$24,000	19,707	$6,900	200	*173
Boardman	10,000	10,018	6,000	448	276
Bridge	. . .	4,471	2,300	79	81
Dana	3,000	14,317	4,600	110	103
Dunster	3,000	10,000	2,000	100	71
Felton	6,000	15,000	6,000	184	150
Gannett	3,000	8,806	3,000	192	175
Gore	20,000	9,900	7,000	432	422
Harvard	3,000	10,000	7,000	109	95
Holmes	5,000	11,182	4,500	224	221
Mason	2,000	10,000	6,000	117	108
Otis	12,000	8,095	6,500	434	416
Quincy	7,000	8,392	5,000	126	99
Reed	4,000	12,000	1,800	224	125
Riverside	5,000	11,200	3,500	224	212
Sargent	4,000	9,546	5,700	200	167
Willard	25,000	20,054	8,000	510	435
Wyman	5,000	15,000	2,500	224	189
Brattle School . .	. . .	. . .	. . .	49	45
Putnam School . .	. . .	. . .	. . .	56	59
City School	. . .	. . .	. . .	84	77
Total	$141,000	207,688	$88,300	4,326	3,699
	Agassiz.	Boardman.	Dunster.	Reed.	Willard.
No. of furnished rooms unoccupied	. .	2	. .	1	1
No. of rooms unfurnished	2	. .	2	. .	1

* A Grammar Class of thirty scholars, and a Training Class of nine, are included in the number.

An examination of the tables alone would lead to the conclusion, that no additional accommodations are required for the scholars in our public schools. The fact is, however, that while there are 1,172 unoccupied chairs in the different schoolhouses of the city, and vacant rooms in which four hundred more can be placed, there are schools not well accommodated, and

sections of the city where new schoolhouses are needed. In making this statement, I do not propose to recommend that new schoolhouses be built the coming year, except that I should fail in the discharge of my duty did I not raise the question whether, even this year, a new house should not be built for the Bridge School at the Lower Port. A recitation-room six feet, nine inches, by ten feet, six inches, unwarmed, unventilated, and lighted by four panes of glass, cannot be deemed a proper place for a class of fifteen scholars, even during the time required for a recitation.

The High School, for the past seven years, has had an increase of from twenty to thirty scholars annually, except for the year 1875, when the increase was only four. Should the same rate continue another year, as it probably will (the first classes in the Grammar Schools being twenty per cent larger than they were one year ago), even the sitting-capacity of the house, as the seats are now arranged, would be exhausted. But this is not the most serious part of the difficulty; for additional seats might possibly be put into some of the rooms. With the present number, however, the work of the school is carried on under many disadvantages. A person must be familiar with the management of the school, and the plan of instruction, to appreciate fully the difficulties. Classes cannot be seated in rooms near those in which they recite. There is a necessity, therefore, of frequent going up and down stairs; more than is conducive to the health of pupils, or to the good order of the school. The divisions of some of the classes are already too large for the most effective drill. It should be remembered that the whole number of scholars in a school, divided by the number of teachers, may not indicate the size of each division. Scholars in different grades cannot recite together, though they be seated together. When there are more in a particular grade than can be properly taught in one division, another must be formed, even though the divisions are small. With three courses of study, — a Classical Course, a Complete English Course, and a Shorter English Course, — it is not probable that the numbers in each, for each year of the school course, will always be favorable to an economical classification and arrangement. Should the school increase, an additional teacher will be

needed; but there is no room for another teacher. The work must be carried on by the present number of teachers, under increasing disadvantages with every additional pupil, until more room is provided. The times, however, are still unfavorable to the enlargement of the building; and temporary arrangements must be made, if additional room is absolutely required.

The Grammar Schools are well provided with accommodations. The houses, with one exception, are new, or have recently been remodelled; and there are unoccupied rooms in five of the seven buildings. The work of the Putnam School could be carried on to better advantage, if the large room was divided; and the management of the lower classes would be less difficult, if the double desks (the only double desks now in use in the city, except a few in the Felton Schoolhouse) were made over into single desks.

The Primary Schools, also, have ample accommodation; but the buildings are not conveniently located. Sections of the city have grown so rapidly, that the schoolhouses in those localities will not contain the children living near them. Of necessity, therefore, a part of these must be sent to schools more remote. Were it a question of distance only, this might not be a sufficient cause for complaint; but parents are anxious when their little ones are exposed to the dangers of the streets, and feel that nearer accommodations should be provided. A new house is needed in the vicinity of Rideout Street, and one in the vicinity of Howard Street. The Felton Schoolhouse should be remodelled the coming year. It can be made, at a small cost, into one of the best schoolhouses in the city: at the present time, there is nothing pleasant or cheerful about it, and parents reluctantly send their children to the school. Should the High School require room outside its present building, this house, if remodelled, would afford the best temporary accommodation that could be provided. I need not refer to the wants of the City School, at the Almshouse; for a special committee has been appointed to consider what changes should there be made.

Several causes have combined to give the city at the present time so much unoccupied school room. The remodelling of the Grammar schoolhouses increased their seating-capacity; several

of the Primary buildings were intended to meet the increasing needs of the sections in which they are located; and, during the past two years, the public schools have lost in numbers by removals from the city on account of the general depression in business, and by the establishment of the Parochial School in Ward Two. Under the single-room system, the number of sittings will usually be in excess of the number of pupils; for classes cannot always be arranged in divisions of fifty (that being the number of chairs in most of our rooms) consistently with the best interests of the schools.

THE HEATING OF OUR SCHOOLHOUSES.

Sufficient attention has not been given to the proper heating of our schoolrooms. It is a serious matter for teachers and pupils to do their work in rooms either too cold or too hot. The same, of course, is true in reference to rooms not properly ventilated; but as the subject of ventilation has been fully presented in a Report upon the Sanitary Condition of our Schoolhouses, made by a special committee, I will limit myself to the subject of heating.

Dr. D. F. Lincoln, in his valuable paper on "The Nervous System as affected by School Life," says, "School work, if performed in an unsuitable atmosphere, is peculiarly productive of nervous fatigue, irritability, and exhaustion." By "unsuitable," he explains, "is chiefly meant 'close air,' or air that is hot enough to flush the face, or cold enough to chill the feet, or that is 'burnt,' or infected with noxious fumes of sulphur or carbonic oxide."

These faults exist in many of our schoolrooms, and should be remedied. As facts shown by figures are more convincing than mere statements, I have classified the records of the temperature of the different schoolrooms, taken at fifteen minutes of nine each morning, for the school-days of December, January, and February, 1875–76, there being sixty-nine records for each room.

The following table shows what per cent of the whole number of records in each school indicated a temperature, first, of 60°, or lower; second, of from 61° to 65°; third, of 80°, or higher; and, fourth, between 65° and 80°: —

Schoolhouses.	60°, or lower.	61° to 65° inclusive.	80°, or higher.	Between 65° and 80°.
Allston	.009	.039	.024	.925
Harvard	.001	.035	.041	.92
Putnam	.032	.062	.104	.80
Shepard	.055	.088	.091	.759
Thorndike	.10	.129	.084	.686
Washington	.027	.031	.328	.612
Webster	.012	.031	.292	.663
Agassiz	.014	.033	.033	.913
Boardman	. .	.005	.356	.512
Bridge	.028	.072	. .	.898
Dana	. .	.014	.195	.789
Dunster	. .	. .	.362	.637
Felton	. .	.009	.294	.695
Gannett	. .	.028	.315	.655
Gore	.115	.112	.072	.699
Harvard Primary	. .	. .	.275	.724
Holmes	.159	.239	.021	.579
Mason	.188	.282	.014	.507
Otis	.03	.137	.175	.655
Quincy	. .	.05	.275	.673
Reed	.235	.134	.072	.557
Riverside	.206	.173	.102	.514
Sargent	. .	. .	.344	.655
Willard	.044	.081	.014	.859
Wyman	.028	.028	.137	.804

From the table the following facts are gathered: —

1. That the temperature of two-thirds of all the houses was at times 60°, or lower, the number of cases varying in different buildings from two-tenths of one per cent to 23.5 per cent of the whole number of records.

2. That the Reed Street Schoolhouse, the Riverside, the Mason, the Holmes, the Gore, and the Thorndike were *too cold* (that is, 60°, or lower) more times than any of the other houses.

3. That the temperature of all the houses but one was at times 80°, or higher, the number of cases varying in different

buildings from 1.4 per cent to 36 per cent of the whole number of records.

4. That the Dunster Schoolhouse, the Boardman, the Sargent, the Washington, the Gannett, the Felton, the Webster, the Harvard Primary, and the Quincy were *overheated* (that is 80°, or higher) more times than any of the other houses.

In examining the table, it should be noticed that the per cent showing what part of the whole number of records was between 65° and 80° was affected equally by those of 80°, or higher, and those of 60°, or lower. Take, for example, the Boardman, Mason, and Riverside Schoolhouses. The per cent of the records indicating a temperature between 65° and 80° is nearly the same in each case, being about 51 per cent. The Boardman per cent was brought thus low because the building was so frequently heated to 80°, or higher; the Mason, because it was so frequently heated only to 65°; while the Riverside was affected by both causes, showing that it was possible, with proper care, to heat the house more uniformly.

From the records, the following additional facts, not shown by the table, are gathered: —

1. In *nineteen* different rooms, the thermometer indicated a temperature of 60°, or lower, from ten to twenty-five times in each room out of the sixty-nine cases recorded.

2. In *twenty-nine* different rooms, the thermometer indicated a temperature of 80°, or higher, from twenty to fifty-five times out of the sixty-nine cases recorded.

3. The lowest temperature indicated was 32°; the highest, 110°. The lowest average temperature of any room was 63°; the highest average, 87.5°. In one hundred and thirty-seven instances, the records indicated a temperature of 55°, or lower; in a hundred and sixty-seven, a temperature of 90°, or higher. Of course, a temperature too low is practically worse than one too high. In the former case, the school work must be (or ought to be) suspended; while in the latter it can go on while the room is being cooled to the proper point. Besides, the cooling can be effected more easily and more promptly than the heating.

The following reasons may be given why our schoolhouses should be more evenly heated to the proper temperature: —

1. If they are too cold, schools must be closed, while all their expenses go on.

2. If overheated, fuel is wasted, and furnaces burned out.

3. A proper temperature is favorable to the most successful work.

4. The health of teachers and pupils alike requires it. This is the most important reason of all.

The care of the schoolhouses does not rest with the School Committee, but with the Committee on Public Property. Confident that this committee will give the subject the attention which its importance requires, I have placed in their hands copies of the records to aid them in making such changes in the arrangement and management of the furnaces as they may deem best.

FREE TEXT-BOOKS.

According to the statute of 1873, "Any city, by an ordinance of the city council, and any town by legal vote, may authorize the school committee to purchase text-books for use in the public schools, said text-books to be the property of the city or town, and to be loaned to pupils, under such regulations as the school committee may provide."

I do not propose at this time to enumerate the arguments in favor of the system of free text-books. My only purpose is to show the advantages of a partial application of the law quoted above. In the first place, the annual cost of supplying books to scholars whose parents are unable to buy them would be greatly reduced. Books furnished under the old law become at once the property of the parent. They can be taken from the schoolroom when the child leaves school, or be sold when he is promoted to a higher class. Under the new law, books would continue to be the property of the city, and could be used by successive classes, until they were worn out. The cost of furnishing books as now supplied is not inconsiderable. During the months of September, October, and November of the past year, the city paid the sum of two thousand two hundred dollars for that purpose. A saving would be made on the first cost of all books purchased directly by the city; and fewer new books would be required each year, if old books were carefully preserved.

In the second place, there are books now bought by every pupil of a school, when less than one-third of the number, if owned by the city, would answer equally well, and would last for years. Take, as an example, Hooker's "Child's Book of Nature." This book is divided into three parts, which are bound separately. Less than one hundred pages are assigned to each class of the Grammar Schools. The instruction is usually given by familiar talks, after the lessons have been carefully read by the pupil. With fifty copies of each part in a school, there would be no difficulty whatever in arranging the work in a convenient and satisfactory manner. If every pupil now using the book should buy a new copy, the aggregate cost to parents would be $1,800, and $300 would be required each succeeding year for new copies; while for $400 the city could buy all the copies really needed, and no further expense would be necessary for several years.

In the third place, all the reading-books, for the higher classes at least, should be supplied by the city; not because there would be any saving of expense for the first two or three years, but in order to secure for our schools a variety of instructive reading-matter. If the city owned the books, they would gradually accumulate, and when a sufficient number of any particular book was secured some other could be selected; and in this way a valuable collection would ultimately be made. After the schools were once supplied, the annual cost of reading-books to the city need not be one-half the present cost to parents.

In the fourth place, writing-books, drawing-books, and stationery should be furnished. They are now furnished to a part of the pupils; and the additional expense of supplying them to the whole would be comparatively small, while the advantages would be positively great. Writing-books and drawing-books bought at the stores by children, are, in many cases, jammed, and rendered unfit for use, on the way to school; while the time lost to a scholar, and sometimes to a whole class, simply for the want of a pen, or of a sheet of paper, can only be correctly estimated by one familiar with school work. Teachers, in many cases, keep these articles for sale, not from choice (and there are reasons why they should not do it), but because they

feel the necessity of having them at the schoolroom ready for use.

The advantages to be gained by a partial application of the law may be briefly stated as follows: —

1. A saving to the city of many hundreds of dollars annually, in supplying books to scholars whose parents are unable to buy them.

2. A large saving to parents, offset by a small expense to the city, when a limited number of copies of any book will answer the purpose for which the book is used.

3. A securing of sets of valuable books for reading, the amount spent by the city being about the same for a few years as that now spent by parents, and considerably less in succeeding years.

4. A saving of time both to teachers and pupils; a removal of one cause of irritation between pupils and teachers, and, I might say, between parents and teachers; also a securing of suitable writing and drawing materials for all the pupils.

SCHOOL RECORDS.

Six years ago, the attention of the School Board was called by the Superintendent of Schools to the importance of having a system of records, whereby all important facts and figures relating to our schools should be preserved. The Registers furnished by the State answer well the purpose for which they were designed; but the information contained in them needs to be arranged and classified to be of permanent value. As was said in the Report to which reference is made, we ought to have record-books prepared especially for the use of our own schools. Besides the facts required by the State Registers, there are others of equal importance which should be preserved. A hundred scholars enter a school at the same time. In six years, twenty complete the course of study. Should it not be known at what stage of the course, and for what cause, the remaining eighty dropped out of the school, or failed to do the work? A careful study of the facts might show that a change of programme was needed. Again: a certain number, under equally favorable circumstances, enter two different schools. In three years, four-fifths of those who entered the one pass on to a

higher grade, well prepared to do advanced work; while only two-thirds of those who entered the other are ready for promotion. If these are facts, should they not be known? It is possible, that, in the one case, the teacher is requiring too much of her pupils; and that, in the other, too little is required, and time is wasted. These examples will serve to indicate the practical value of such records in calling attention to differences in the schools, and in suggesting possible improvements in their management. They would furnish data for the intelligent study of many questions that may arise concerning methods of instruction and discipline, especially when the results of several successive years ought to be considered. They would form a statistical history of the working of our school system, which, with each year's additions, would be of increasing service to the Committee and the Superintendent in the discharge of their duties. The tabulated figures would supply unanswerable arguments for needed reforms; while at other times they might be quite as useful in showing that no change was called for. It is easy to imagine cases in which they might be effectively employed to correct mistaken notions in the community with regard to school work, or to resist popular pressure in favor of some miscalled "reform" in the school system. The value of the records in a single instance of this kind might far outweigh their whole cost for many years.

READING.

Having given my views on this subject at some length in my last Report, I will only state what has since been accomplished, and what we may hope to do the coming year. As no change could be made in the method of supplying text-books, for the want of an appropriation, a plan was adopted by which a larger amount than usual of outside reading has been secured to the schools. Blank cards, with the heading "Selections for Reading" printed upon them, were furnished to the Grammar and Primary Schools. Upon these the teachers have pasted a great variety of appropriate reading collected from papers, magazines, and, in many cases, from books. Pupils have read from these cards with special pleasure and delight. Even were the schools supplied with valuable sets of reading-books, it would be well

to keep on hand a few blank cards, in order that the interesting items of the day, and the new gems of poetry or of prose, might be preserved in a convenient form for school use.

To awaken a deeper interest upon the subject, each teacher of the Grammar Schools was requested to give me the name of some book likely to interest and profit pupils of the age and attainments of the various classes in these schools. This was done with the view of printing a list for the use of the schools, in the hope that pupils who have formed the habit of reading, and who take books from the public libraries, would be guided to a better selection, and that others who as yet have no inclination to read would be led by curiosity to begin. I feel confident that an appropriation will be secured for the coming year which will enable the Committee to make such changes in the method of supplying reading-books as they may deem best. Should this not be done, a small amount can be expended for reading purposes from the usual appropriation for text-books. A few copies of some book, like "The Story of Our Country," by Mrs. Munroe, or "The Boys of '76," by Charles Carleton Coffin, can be placed in the Grammar Schools; and selections can be made and printed on cards for the Primary Schools. I mention "The Story of Our Country" and "The Boys of '76," because these books are written in a style which would make them interesting to younger pupils than study Anderson's "History of the United States." Nearly two-thirds of all the pupils entering the Grammar Schools leave before they reach the first class, in which alone history is studied; hence they go out into the world ignorant of their country's history, though familiar with the rivers and capes of Asia.

SENTENCE-WRITING.

A work has been quietly going on for the past six years in the Grammar Schools, the good results of which are now becoming apparent. I refer to the systematic instruction which has been given in sentence-writing. Formerly only the upper classes were expected to express their thoughts on paper; and it is no wonder that, without previous training, the failure to do this easily and correctly was so general. Now the work is begun in the lowest class, and is carried forward step by step

through the grades above. The sixth class is required to write sentences consisting of simple words, also sentences containing the names of the days of the week and of the months; the fifth class, to construct sentences containing common words of like pronunciation, but of different spelling, also sentences containing dates, holidays, and proper names of persons and places; the fourth class, to practise letter-writing, and to use honorary and professional titles, abbreviations, and capital letters; the third class, to continue letter-writing, make out bills, and write short compositions on familiar subjects, of from eight to ten lines on letter-sheet; the second class, to write practical business forms, such as letters, receipts, promissory notes, etc., and continue the writing of compositions of from ten to fifteen lines; and the first class, to review letter-writing and business forms, and continue the writing of compositions. The exercises are to be practised daily in the fifth and sixth classes, and frequently in the others. All the classes are to review the previous work.

By carrying out this simple programme, excellent results have been secured. The importance of the work, it seems to me, should give it for the future a place at the public and private examinations. I will add, that considerable interest in this same line of instruction has also been awakened in some of the Primary Schools by the use of "Picture Cards" to talk and write about. At the last examination, there was an exercise of special interest in one of the schools, showing the use of these cards.

PENMANSHIP.

For twenty years past, I have frequently seen the writing-books in the different Grammar Schools in Cambridge, and I am confident that at no previous time could so many specimens of excellent penmanship have been collected as during the past year. Even the Primary Schools can show writing on slates, which a few years ago would have been creditable to the lower classes of the Grammar Schools. As an experiment, a single class in one of the Primary Schools has been furnished with writing-books. The results may show that they can be used to advantage in this grade.

DRAWING.

In my last Report I said, "To secure the best results in any branch of instruction, there must be systematic work from the beginning," and added, "This is not the case with regard to drawing in our schools; nor will it be, till there is special supervision of the whole work." Since September, the drawing in the Primary Schools has been under excellent supervision. These schools had previously done but little systematic work. Mrs. Bowler, the drawing teacher, says, "When I came, I found that there had been some attempt to teach drawing in all the classes, but with little or no regular system; and the results varied according to the interest of the teacher. Now the work is graded and systematized, and the following divisions of the subject taught: Freehand on slate and blackboard, Memory, and Dictation." She also says, "With almost entire unanimity, the teachers have cordially seconded my labors; and I can congratulate them upon the success so far achieved. Meetings of the teachers are held weekly for the purpose of giving to them such hints as may be needed, and such instruction as will enable them to illustrate their work upon the blackboard, and to analyze the figures which their pupils are required to draw." The drawing in the Grammar Schools and in the High School has been favorably spoken of by competent critics. When the effects of the training in the Primary Schools shall be felt in the higher grades, we may expect even better work than at present, with a smaller expenditure of time and labor.

VOCAL MUSIC.

The good results of "systematic work from the beginning" are seen in the department of music. Now each class below the third in the Grammar Schools has definite work assigned to it, and a few minutes each day is devoted to its accomplishment. This work is not simply the singing of a few songs by rote, as was formerly the case, except when the singing master gave his weekly lesson; but it consists, in the lower classes, of exercises upon the scale, and in reading simple music from the charts and from the blackboard; in the higher classes, of more difficult exercises, and the singing of pieces from the "Musical

Reader" by note and word. In this way, I believe that we are accomplishing the object which should be aimed at in the teaching of music in our public schools, namely, that of *reading music at sight.* The majority of our pupils will derive their greatest pleasure and profit, not from understanding the science of music, though the rudiments of course should be taught, but from being able to join with others in singing in the family circle, at the social gathering, or at the service of praise in the sanctuary.

Mr. Lincoln, the Singing Master, speaks of the work as follows: "What looked like an experiment, when the teaching of music was put into the hands of the teachers of the lower classes in the Grammar Schools, has fulfilled its promise. In those rooms where the work has been begun and followed up in good faith, the success attending it has been unequivocal. The pupils who have already reached the classes under my immediate charge show good results from the instruction they have received. Not only are they better prepared to appreciate and perform the music placed before them in these upper classes, but the spirit they manifest is good; they are attentive, and willing to work both patiently and well.

"I will not presume to speak of the success of my own work for the past year, but may say that my duties have never interested me more, nor afforded me greater pleasure."

CENTENNIAL WORK.

Although the schools of Cambridge did not contribute largely to the Educational Department of the Centennial Exhibition, it seems proper that a statement of what was done should be given.

At the regular meeting of the Board in January, a committee was appointed to take charge of all preparations for the Exhibition, and was also authorized to make the necessary expenditures within the appropriation that might be made by the City Council. This Committee, having decided what preparation should be made, asked of the City Council the sum of three hundred dollars, which was readily granted. The contribution as prepared and sent was as follows: photographic views, suitably framed, showing the exterior and interior of the High Schoolhouse, of the Harvard Grammar, and of the Agassiz

Primary, and the interior of the drawing-room in the new City Building, Brattle Square; a complete set of examination questions for promotion, most of which had been used the previous year; drawings, either in frames or portfolios, from the Grammar Schools, and from the Free Evening Drawing Schools; bound volumes of scholars' work; clay models by the Primary classes connected with the Training School, with a history of the school by the principal, and an essay upon clay modelling by a pupil of the school.

As I have said, the contribution was not large; but still it would give to one familiar with school work a very correct impression of our schools. The examination questions would indicate the general character of the teaching, and the standard for promotion; for it would be presumed that the examinations were in the line of the teaching, and that the majority of those examined were expected to obtain a fair average per cent of correct answers. In the history of the Training School, it would be seen that careful preparation for the work of teaching is required; and the old maxim, "As the teacher, so the school," would suggest the influence which this training must have upon the character of the schools. The scholars' work was not a miscellaneous collection with no special significance. The specimens of penmanship were taken from the regular writing-books, and therefore represented the usual work in that department. The case of clay models, containing, as it did, a great variety of geometrical forms, showed, even without the essay accompanying it, the prominence given to the use of objects as a means of instruction. The papers on "Rocks" illustrated another method, that of oral instruction; while the examination papers showed that practical work is not neglected in our schools.

GENERAL REMARKS.

During the year, the schools have been consolidated, to some extent; the number of teachers being, at the present time, eight less than a year ago, while the number of pupils remains about the same. By the returns for the 1st of January, the High School averages thirty-eight pupils to a teacher, not including the principal; the Grammar Schools, forty-five; the Primary Schools, forty-seven. Unless there should be an increase in the

number of pupils in two or three of the schools, a reduction can still be made in the number of teachers. I do not favor, however, a permanent increase of the number of pupils to a teacher. It would not be conducive to effective teaching, nor to good order. In Cambridge, the schools are carried on almost entirely without resort to corporal punishment. This fact should not be forgotten in determining the number of pupils to a teacher. The size of a large part of our Grammar schoolrooms should also be considered in determining this number. The Grammar schoolhouses were built when our schools were organized on a different plan, and in remodelling them it was not practicable to make the rooms so large as was desirable.

While I have devoted my whole time to school work, I have not been able to visit the schools for careful inspection so frequently as I would like. The more I know of the schools, however, the more impressed I am with their varying degrees of excellence, both as to management and as to methods of instruction. Were teachers paid according to their worth, we should have more grades of salaries than at present. This is not practicable; but some plan should be devised by which the work in a few of the schools should be raised to a higher standard. A special committee might be appointed, whose duty it should be to visit any school when requested by the Sub-Committee having it in charge, or by the Superintendent of Schools, with a view to securing better work, even if a change of teachers should be found necessary.

Beneficial results may be expected from the connection which has been established between the Primary Schools and the Training School. The visits of the principal of the Training School to the Primary Schools, many of which are under the charge of her former pupils, cannot fail to be of service to the teachers, and to widen the influence of the Training School.

Our Primary Schools, unlike our High and Grammar Schools, are really made up of independent classes. Some of the schools have as many as eight or ten of these classes, or divisions. Each teacher has the entire control in her own room, while no teacher has authority to decide what the management of the whole school shall be in the halls and yards. Each teacher decides how many of her class shall be promoted at the end of

the year; and if the division of the work is satisfactory to all the teachers, the classification is at once completed; if not, there is delay until the Committee can be consulted. No teacher feels at liberty to raise the question whether a larger or smaller number should be promoted from any particular class. Should it be for the advantage of individual pupils, at any time during the year, to be placed in higher or lower classes, it is the duty of no one teacher to see that the changes are made. It seems to me that there should be a responsible head in each of the schools, at least in those composed of four classes or more. One of the present teachers in each school might be designated as principal, or the schools might be placed in charge of the Grammar masters.

The Reports of the Evening Schools and the Evening Drawing Schools for previous years have been made before the close of the school terms, and of necessity, therefore, have been incomplete. This year I have thought it best not to report upon these schools until all the facts shall be known, except to give the two items found in the "Summary of Statistics."

FRANCIS COGSWELL,
Superintendent of Public Schools.

ORDINANCES PASSED IN 1876.

AN ORDINANCE IN RELATION TO THE PAYMENT OF CERTAIN LABORERS TO BE EMPLOYED BY THE WATER BOARD IN CONNECTING AND IMPROVING CERTAIN PONDS, UNDER SPECIAL AUTHORITY FROM THE CITY COUNCIL.

SECTION 1. — The Mayor is hereby authorized to draw his drafts, from time to time, upon the City Treasurer, for the payment of laborers employed in connecting and improving certain ponds, under special authority from the City Council, — for the sum of One Thousand Dollars each, — such drafts to be countersigned by the Auditor, and the amount thereof to be charged to the appropriation for Extension of Water-Works.

SECT. 2. — Such drafts shall be placed in the hands of the City Treasurer, who shall pay to the laborers above mentioned such sums as shall be called for by orders given to them in the manner hereinafter provided, upon presentation and delivery to him of such orders: *Provided*, *however*, that the aggregate amount so paid by the Treaurer shall not exceed the amount of the Mayor's drafts which he shall have received.

SECT. 3. — The Water Board is hereby authorized to prepare suitable orders upon the Treasurer for the payment of One Dollar each, one of which orders may be paid by said Board, or its authorized agent, under such regulations as the Board may prescribe, to a laborer for each day's work at the ponds; and such orders, when paid, shall be delivered up to the City Treasurer, and retained by him.

SECT. 4. — Whenever it shall appear from the books of the Treasurer that the amount of the Mayor's drafts is exhausted, or nearly so, the Mayor is hereby authorized to draw further drafts, and so from time to time, as may be required to meet the orders of the Water Board: *Provided*, *however*, that the

aggregate amount of the Mayor's drafts shall not exceed the amount specially appropriated for the work above mentioned.

[*Adopted Jan.* 19, 1876.]

AN ORDINANCE IN AMENDMENT OF AN ORDINANCE IN RELATION TO SINKING-FUNDS.

Of the amounts raised by taxation in the year 1876, under the provisions of the fourth section of the "Ordinance in relation to Sinking-Funds," passed Dec. 22, 1875, the City Treasurer is authorized to pay to the Board of Commissioners of the Sinking-Funds of the City a sum not exceeding Seventy-five Thousand Dollars, on the first day of July, 1876, and the remainder of the amounts so raised on the thirtieth day of November, 1876.

[*Adopted March* 1, 1876.]

AN ORDINANCE IN RELATION TO PAYMENT OF CITY EMPLOYEES.

SECTION 1. — Heads of departments shall furnish monthly pay-rolls of employees in their respective departments, stating the name of each employee, the time for which payment is to be made, the rate of wages, and the amount due him.

SECT. 2. — The City Treasurer shall in person, or by his clerk, pay each employee of the city, his authorized agent or attorney; shall take therefor the receipt of no other person than such employee, agent, or attorney; and may, whenever it is reasonably necessary, to save loss of time to the employees, send a clerk with the necessary funds to such localities as may be convenient for paying the men.

[*Adopted March* 15, 1876.]

AN ORDINANCE IN RELATION TO PRISON POINT BRIDGE, BEING IN AMENDMENT OF CHAPTER XXV. OF THE REVISED ORDINANCES.

Chap. 25 of the Revised Ordinances is hereby amended by adding thereto the following: —

SECTION 36. — The provisions of the three preceding sections

shall apply to Prison Point Bridge; and the Commissioners appointed by the Thirty-third Section of the Ordinance to which this is in addition shall have and exercise all the powers conferred by the three hundredth chapter of the Acts of the Legislature of the year eighteen hundred and seventy.

[*Adopted March* 22, 1876.]

AN ORDINANCE IN RELATION TO THE FIRE DEPARTMENT.

SECTION 1. — Each Steam Fire Engine Company appointed by the Mayor and Aldermen shall consist of twelve men; and each Hook and Ladder Company shall consist of seventeen men.

SECT. 2. — Hereafter Steam Fire Engine Companies shall not ballot for Assistant Foremen of their respective companies, but the drivers of hose-carriages shall, in addition to their other duties, perform those required by Sect. 11 of Chap. 10 of the Revised Ordinances, without extra compensation therefor.

SECT. 3. — All ordinances, or parts of ordinances, inconsistent with Sects. 1 and 2 of this ordinance, are hereby repealed.

[*Adopted May* 3, 1876.]

AN ORDINANCE ESTABLISHING THE SALARIES OF CERTAIN CITY OFFICERS.

From and after the first Monday in January, 1877, the salaries of the officers hereinafter mentioned shall be as follows: —

Mayor, per annum	$2,250 00
Treasurer, "	2,700 00
Auditor, "	900 00
Board of Assessors, per annum	4,500 00
Assistant Assessors, per day	3 50
City Engineer, per annum	2,750 00
Chief of Police, "	1,800 00
Superintendent of Streets, per annum	1,800 00
Sealer of Weights and Measures, "	400 00

Engineers of Steamers,	per month . .	$90 00
Drivers of Fire Department,	" . .	75 00
Captains of Police,	" . .	1,100 00
Policemen, per day		2 75

[*Adopted Sept.* 20, 1876.]

AN ORDINANCE IN RELATION TO THE WATER-WORKS.

Sect. 13 of Chap. 29 of the Revised Ordinances is hereby amended by striking out, near the end of said section, the words, "and the balance of the account on that day," and inserting in place thereof the words, "and so much of the balance of said account, after deducting all expenses and charges of distribution, as shall be equal to three per centum of the par value of the then outstanding Water Bonds."

[*Adopted Oct.* 4, 1876.]

AN ORDINANCE ESTABLISHING THE SALARY OF THE TREASURER OF THE BOARD OF COMMISSIONERS OF THE SINKING-FUNDS OF THE CITY.

The salary of the Treasurer of the Board of Commissioners of the Sinking-Funds of the City shall be Three Hundred Dollars per annum, payable in equal quarterly payments.

[*Adopted Dec.* 2, 1876.]

AN ORDINANCE CONCERNING THE CARE AND MANAGEMENT OF THE BRIDGE CHARITABLE FUND.

SECTION 1. — The fund given to the city by the late Levi Bridge shall be called the Bridge Charitable Fund; and the income therefrom shall be applied in accordance with the provisions of his declaration of trust, as follows: —

"The interest on the principal to be added to the principal, until the Fund, by moneys added thereto, by accrued interest, or by additions from other philanthropic persons, shall amount to Two Thousand Dollars; after which time one-third of the increase of said Fund shall be added to the principal annually forever, and the remaining two-thirds shall be paid over to the

Overseers of the Poor for the time being, to be by them expended for the deserving poor of the City of Cambridge, in such manner as they shall deem best.

SECT. 2. — The Mayor and President of the Common Council for the time being, and one member of the Board of Aldermen, shall be the Trustees of said Fund; and the last-named shall be elected annually in the month of January; and, whenever a vacancy exists in said Board of Trustees, the same shall be filled forthwith in the manner aforesaid.

SECT. 3. — Said Trustees shall have the care and management of said Fund, and shall keep the same invested in such manner as said Board shall deem expedient.

SECT. 4. — The Mayor shall be *ex officio* Chairman of said Board of Trustees; and said Trustees shall keep a record of their doings, and annually, at the close of each financial year, make a report thereof to the City Council.

[*Adopted Dec.* 13, 1876.]

AN ORDINANCE IN RELATION TO THE WATER-WORKS.

Sect. 23 of Chap. 29 of the Revised Ordinances is hereby amended in the clause relating to water-rates, by striking out the word "three" wherever such word occurs, and inserting in place thereof the word "two;" the said amendments being in the first and eighth lines of the last paragraph but one of the aforesaid Sect. 23.

[*Adopted Dec.* 27, 1876.]

AN ORDINANCE IN RELATION TO THE CONSTRUCTION OF BUILDINGS.

SECTION 1. — No building hereafter erected in this city, except manufactories, and halls for public assemblies, shall be built in a range of more than fifty feet without the intervention of a brick wall at least eight inches in thickness, except by permission of City Engineer. Said wall shall be built up at least two feet above the flat of the roof of the highest building of which such wall forms a part, for the full extent of the flat; and the

top of said wall shall be covered with a coping of stone or iron, or of other metal; and, where there is a mansard or a pitch roof, the wall shall be built up to the under-side of the roof-covering (that is, to the top-side of the roof-boarding), which shall be laid and embedded in mortar upon said wall.

SECT. 2. — The exterior walls of every brick building hereafter erected in this city, to be used for the purposes of a dwelling-house, shall be at least twelve inches thick to the second floor above the street, and eight inches for the remaining height, provided the building is not more than thirty feet from side-walk to gutter, in which case the twelve-inch wall shall go to the third floor. All floors and roofs to be anchored to walls not less than once in ten feet.

SECT. 3. — All chimneys hereafter erected in this city shall be built of brick, stone, or other fire-proof non-conducting materials, and shall be built plumb, or nearly, so as to be self-sustaining.

No woodwork of any kind shall be placed at a less distance than one inch from the outside brick-work of any flue; and in no case shall a nail be driven into the masonry of any flue.

SECT. 4. — No smoke-pipe shall pass through stud or wooden partitions of any kind, whether the same be plastered or not, without being guarded either by a double collar of metal with at least four inches' air-space and holes for ventilation, or by a soapstone ring not less than three inches in thickness, and extending through the partition.

No woodwork shall be placed at a less distance than one inch from any tin or other metal flue or flues, pipe or pipes, used, or intended to be used, to convey heated air in any building, unless such flues or pipes be cased with metal, leaving a free circulation of air all around the same.

SECT. 5. —All buildings used for public assemblies, or for manufacturing purposes, where more than twenty persons are employed, and all tenement-houses intended for the occupancy of more than two families, shall be provided with fire-escapes, or two suitable ways of egress, accessible from every floor that is eighteen feet or more above the grade of the land immediately adjoining; said escapes, or modes of egress, to be satisfactory to the officer named in the sixth section hereof.

SECT. 6. — The City Engineer shall have supervision over all matters provided for in this Ordinance, and shall have authority to prescribe the character and thickness of the walls referred to in the latter part of Sect. 3, and the character of the fire-escapes, or modes of egress, referred to in Sect. 5 hereof. All permits given by him in reference to such matters to be in writing. Parties dissatisfied or aggrieved, by any decision or action of said City Engineer, as to matters placed under his charge by authority of this Ordinance, may appeal to the Board of Mayor and Aldermen, whose decision in such cases shall be final.

SECT. 7. — Any person or persons violating any of the provisions of this Ordinance shall, upon written notice from the officer named in Sect. 6 hereof, served upon him or them, alter said building in conformity with the provisions of this Ordinance within a reasonable period of time from said service. Any party or parties refusing or neglecting to comply with such notice shall be liable to a penalty of not less than twenty nor more than fifty dollars, and shall be restrained from further violation of this Ordinance by provisions already established by law.

[*Adopted Dec.* 27, 1876.]

GOVERNMENT

OF

THE CITY OF CAMBRIDGE.

1877.

MAYOR.

HON. FRANK A. ALLEN.

ALDERMEN.

JOHN CLARY.
RUSSELL S. EDWARDS.
JAMES A. FOX.
CHARLES J. MCINTIRE.
CHARLES W. MUNROE.
GEORGE F. PIPER.
EDMUND REARDON.
MARTIN L. SMITH.
WALTER S. SWAN.
DANIEL H. THURSTON.

ALDERMEN, BY WARDS.

Ward I. Aldermen SWAN and MUNROE.
Ward II. Aldermen SMITH and THURSTON.
Ward III. Aldermen CLARY and MCINTIRE.
Ward IV. Aldermen FOX and REARDON.
Ward V. Aldermen EDWARDS and PIPER.

CLERK.

JUSTIN A. JACOBS.

COMMON COUNCIL.

PEREZ G. PORTER, *President.*

Ward I.

WOODWARD EMERY. WILLIAM POLAND.
ARCHIBALD M. HOWE. JAMES H. SNOW.

Ward II.

SAMUEL NOYES, Jun. SILAS RHOADES.
PEREZ G. PORTER. JOSEPH W. SMITH.
EDWARD P. TUCKER.

Ward III.

JOSEPH COGAN. JOHN McSORLEY.
HENRY A. DOHERTY. JOHN T. SCULLY.
DANIEL B. SHAUGHNESSEY.

Ward IV.

GEORGE W. RAWSON. NATHAN UNDERWOOD.
Z. H. THOMAS, Jun. EDWARD H. WHITNEY.

Ward V.

HENRY K. PARSONS. GEORGE F. WHITING.

CLERK.

J. WARREN COTTON.

PAGE.

WILLIAM PEARSON.

CITY CLERK.

JUSTIN A. JACOBS.

CITY MESSENGER.

FRANCIS L. PRATT.

COMMITTEES OF THE CITY COUNCIL.

JOINT STANDING COMMITTEES.

ON FINANCE.

	Common Council.
The Mayor.	The President.
	George F. Whiting.
	Archibald M. Howe.
Aldermen.	Edward P. Tucker.
Walter S. Swan.	Z. H. Thomas, jun.
Edmund Reardon.	Henry A. Doherty.

ON PUBLIC INSTRUCTION.

Aldermen.	**Common Council.**
Walter S. Swan.	The President.
James A. Fox.	Z. H. Thomas, jun.
	George F. Whiting.
	Woodward Emery.

ON ORDINANCES.

Aldermen.	**Common Council.**
George F. Piper.	Archibald M. Howe.
Charles J. McIntire.	Z. H. Thomas, jun.
	Samuel Noyes, jun.

ON ACCOUNTS.

Aldermen.	**Common Council.**
Edmund Reardon.	Woodward Emery.
John Clary.	Edward P. Tucker.
	Edward H. Whitney.

ON PUBLIC PROPERTY.

Aldermen.	**Common Council.**
Walter S. Swan.	Silas Rhoades.
John Clary.	George W. Rawson.
	Henry K. Parsons.

ON THE ALMSHOUSE.

Aldermen.	**Common Council.**
Martin L. Smith.	George W. Rawson.
Russell S. Edwards.	Woodward Emery.
	Joseph Cogan.

ON ROADS AND BRIDGES.

Aldermen.	Common Council.
Edmund Reardon.	John McSorley.
Daniel H. Thurston.	Silas Rhoades.
	Henry K. Parsons.

ON FUEL.

Aldermen.	Common Council.
John Clary.	William Poland.
Martin L. Smith.	Joseph Cogan.
	Nathan Underwood.

ON LAMPS.

Aldermen.	Common Council.
Russell S. Edwards.	Nathan Underwood.
Daniel H. Thurston.	John T. Scully.
	James H. Snow.

ON WATERING STREETS.

Aldermen.	Common Council.
Charles J. McIntire.	George W. Rawson.
Martin L. Smith.	James H. Snow.
	Samuel Noyes, jun.

ON PRINTING.

Alderman.	Common Council.
James H. Fox.	Daniel B. Shaughnessey.
	Samuel Noyes, jun.

ON THE FIRE DEPARTMENT.

Aldermen.	Common Council.
Charles W. Munroe.	George F. Whiting.
Martin L. Smith.	William Poland.
	John McSorley.

ON CITY ENGINEERING.

Aldermen.	Common Council.
George F. Piper.	William Poland.
Charles W. Munroe.	John T. Scully.
	Joseph W. Smith.

ON ASSESSORS' DEPARTMENT.

Alderman.	Common Council.
Russell S. Edwards.	Joseph W. Smith.
	Daniel B. Shaughnessey.

JOINT SPECIAL COMMITTEE.

ON SOLDIERS AND THEIR FAMILIES.

Aldermen.	Common Council.
Charles J. McIntire.	Joseph W. Smith.
James A. Fox.	Henry A. Doherty.
	James H. Snow.
	Edward H. Whitney.
	Henry K. Parsons.

Standing Committees of the Board of Mayor and Aldermen.

ON POLICE.

The Mayor.
George F. Piper.
Walter S. Swan.
John Clary.

ON THE FIRE DEPARTMENT.

Charles W. Munroe.
Martin L. Smith.
Edmund Reardon.

ON ROADS AND BRIDGES.

Edmund Reardon.
Daniel H. Thurston.
Russell S. Edwards.

ON SEWERS AND DRAINS.

Daniel H. Thurston.
Russell S. Edwards.
Charles J. McIntire.

ON LICENSES.

George F. Piper.
Walter S. Swan.
Charles W. Munroe.

ON HEALTH.

Daniel H. Thurston.
James A. Fox.
Charles W. Munroe.

ON BONDS.

Daniel H. Thurston.
Martin L. Smith.
James A. Fox.

Standing Committees of the Common Council.

ON ELECTIONS AND RETURNS.

Edward P. Tucker.
Henry A. Doherty.
John T. Scully.

ON BILLS IN THE SECOND READING.

Edward H. Whitney. Daniel B. Shaughnessey.
Nathan Underwood.

ON ENROLLED ORDINANCES.

Archibald M. Howe. Joseph Cogan.
John McSorley.

Clerk of Committees.

John McDuffie.

Board of Health.

The Mayor and Aldermen.

Health Officers.

George H. Copeland. Benjamin F. Bridden.
Timothy Ames. Amos Jones.
Warner W. Simonds. Leonard Shackford.
Andrew G. Smith. Thomas D. Cook.

Surveyors of Highways.

The same persons who compose the Board of Mayor and Aldermen.

Auditor of Accounts.

Justin A. Jacobs.

Treasurer.

Joseph Whitney.

Assessors.

Andrew J. Green. Levi L. Cushing, jun.
Artemas Z. Brown.

Assistant Assessors.

Thomas Stearns. George L. Mitchell.
John S. Pollard. Benjamin F. Nourse.
Jeremiah Murphy.

School Committee.

Frank A. Allen, Mayor, *ex officio, Chairman.*

Ward I.

John L. Hildreth. Andrew P. Peabody.
Horace E. Scudder.

Ward II.

Henry Hinckley. James H. Hall.
Edward R. Cogswell.

Ward III.

Albert L. Norris. George R. Brine.
John O'Brien.

Ward IV.

George R. Leavitt. Asa P. Morse.
William A. Munroe.

Ward V.

William Fox Richardson. Edmund H. Stevens.
Frank Foxcroft.

Secretary.

W. W. Wellington.

Superintendent of Schools.

Francis Cogswell.

Overseers of the Poor.

The Mayor, *ex officio, Chairman.*

One Year.	Two Years.
Benjamin F. Wyeth.	Sylvanus M. Parsons.
George D. Chamberlain.	George B. Eaton.
John W. Coveney.	John W. Gardner.

Clerk.

Benjamin F. Wyeth.

Warden of the Almshouse.

William E. Hough.

Physician of the Almshouse.

James R. Morse, M.D.

Cambridge Cemetery.

Commissioners.

The Mayor, *ex officio.*

George S. Saunders. John M. Tyler.
George T. Gale. Curtis Davis.
William Page. George R. Brine.

Superintendent.

James K. Farwell.

Trustees of Dana Library.

The Mayor, *ex officio, Chairman.*

Alderman. **Common Council.**

George F. Piper. Edward P. Tucker.

Citizens at Large.

John B. Taylor. John S. March.
Hersey B. Goodwin.

Librarian. **Secretary.**

Miss Almira L. Hayward. John S. March.

Cambridge Water Board.

The Mayor, and President of the Common Council, *ex officio.*

J. Warren Merrill. Henry L. Eustis.
Chester W. Kingsley. George P. Carter (President).
John H. Leighton.

Clerk.

Justin A. Jacobs.

Superintendent of Water-Works.

Samuel W. Dudley.

Water Registrar.

J. Warren Cotton.

Trustees of Sinking-Fund of Water Loan.

The Mayor, City Treasurer, and President of the Common Council.

Commissioners on Sinking-Funds of the City.

One Year.	Two Years.
Charles H. Saunders.	Walter S. Blanchard.
Robert Douglass.	Samuel Slocomb.

Three Years.

Joseph A. Holmes.	John M. Tyler.

Trustees of the Sanders Temperance Fund.

The Mayor, and President of the Common Council, *ex officio*.

Alderman.	Common Council.
John Clary.	Silas Rhoades.
	Woodward Emery.

Trustees of the Bridge Charitable Fund.

The Mayor, and President of the Common Council, *ex officio*.

Alderman.

Walter S. Swan.

Trustees of the Dowse Institute.

The Mayor, and President of the Common Council, *ex officio*.

John C. Dodge. William W. Wellington.

Willard A. Bullard.

Representatives in General Court.

Solomon S. Sleeper.
Emory Washburn.
Leander M. Hannum.
Oliver J. Rand.
Charles F. Thurston.
Joseph J. Kelley.

Police Court.

Standing Justice.

John S. Ladd.

Special Justices.

Henry W. Muzzey.
Woodward Emery.

Clerk.

Thomas McIntire.

City Solicitor.

John W. Hammond.

City Engineer.

William S. Barbour.

Commissioner on West Boston, Craigie's, and Prison Point Bridges.

Ezra Parmenter.

Superintendent of Streets.

George L. Cade.

Superintendent of Lamps.

Benjamin F. Nourse.

Board of Engineers.

Chief Engineer.

Patrick H. Raymond.

Assistant Engineers.

First Assistant	Thomas Casey.
Second Assistant	Richard F. Tobin.
Third Assistant	Daniel O'Connell.
Fourth Assistant	John P. Farmer, jun.

Clerk of the Board.

John P. Farmer, jun.

Police Department.

Chief of Police.

George H. Copeland.

Captains of Police.

District I.	District II.
Timothy Ames.	William Twist.

District III.

John L. Boynton.

Captain of Night Police.

Frederick W. Hagar.

Sergeants of Police.

District I.	District II.
Thomas D. Cook.	Warner W. Simonds.
Andrew Sproul.	Daniel Sherman.

District III.

Matthew R. Moore.	William Mullett.

Policemen.

DISTRICT I.

James B. Morse.
Micah W. Cook.
Andrew G. Smith.
George A. Marston.
Benjamin Kennard.
L. J. Cloyes.
James Miller.
Patrick Doyle.
Leonard Shackford.
Daniel Callahan.
William H. Fitzpatrick.
Frederic B. Pullen.
Albert D. Cleveland.
Henry M. Tyler.
Alonzo S. Harriman.
Thomas W. Penney.
William Evans, jun.
Charles A. Brown.

Hugh McNamee.

DISTRICT II.

Benjamin F. Bridden.
James H. Parks.
George Wood.
John Coleman.
Calvin C. Smith.
Luther Hapgood.
Simon D. Hiscock.
Rufus S. Downe.
Thomas H. Lucy.
Charles B. Jones.
James E. Murray.
John Little.
Thomas S. Hall.
Charles S. Dixon.
William Nickelson.
Lawrence Ducy.
Michael A. Dalton.
James Daily.

James S. Alexander.

DISTRICT III.

Dennis Corcoran.
Moses W. Hooper.
John F. Murray.
Amos Jones.
David N. McCleary.
Stephen E. Day.
John Collier.
Warren A. Eaton.
Otis Dennison.
John W. Skelley.

William F. Batchelder.

Policemen (without pay).

P. H. Raymond.
Thomas J. Casey.
Samuel W. Dudley.
Daniel O'Connell.
John P. Farmer, jun.
Thomas H. Eames.
Edward F. Belcher.
William A. Norris.
John Loughrey.
Thomas Cowan.
Noah M. Cofran.
John Mahady.
Alex. F. Shepherd.
William Hunnewell.

Roland Litchfield.
Charles L. Russell.
William L. Locklin.
G. C. W. Fuller.
J. L. P. Ackers.
Lucius A. Buck.
James C. Wilder.
Thomas McIntire.
James K. Farwell.
Hiram Nevons.
James M. Learned.
George Dale.
Jesse H. Kittredge.
George Smith.
Charles P. Allen.
Samuel F. Hunt.
George J. Sutton.
Patrick Dunnigan.
Alexis Brousseau.
Augustus W. Melvin.
Thomas Briney.
William H. Grieves.
Joshua S. Sanborn.
George W. Wright.
Joseph K. Tarbox.
Joseph Baker.
Thomas Langlan.
Francis M. Mason.
Mark J. Folsom.
Moses M. Child.
George S. Dudley.
Augustus P. Griffing.
William Porter.
Charles H. Stetson.
John Axtman.
Benjamin McIlvaine.
William Hawkins.
James C. Singleton.
S. C. Redding.
Lyman E. Robinson.
George N. Bramhall.
Daniel R. Melcher.
Fred. H. Greenwood.
Frank J. Curtis.
Benjamin F. Livingstone.
Charles A. Gay.
James W. Lovering.
George B. Lothrop.
Orlando B. Richardson.
Richard F. Tobin.
Charles H. Winslow.
Joseph Collins.
E. G. Hall.
George T. Barrington.
Michael Ginty.
John L. Sproul.
William Kelly.
E. F. Young.
George Putnam.
Dennis Murphy.
Timothy Deane.
Charles Brady.
William B. Googins.
John W. East.
N. W. Bunker.
John Clark.
C. W. Ash.
George D. Eaton, jun.
Thomas Montgomery.
Calvin M. Stetson.
Appleton Hubbard.
Moses Dudley.
Patrick Corcoran.
Charles T. Seavey.
William E. Hough.
Henry L. Emerson.
Francis L. Pratt.
William H. McMenimen.
Benjamin Sargent.
William R. Blackman.
Thomas M. Howard.
E. M. Williams.

Keeper of Lock-ups.

George H. Copeland.

Truant Officers.

Mark J. Folsom.
Moses M. Child.
George S. Dudley.
Augustus P. Griffing.
Francis M. Mason.

Constables.

George H. Copeland.
William Twist.
John L. Boynton.
John C. Burdakin.
Thomas Work.
Thomas McIntire.
Frederick A Lull.
Thomas T. Ferguson.
Timothy Ames.
M. S. Bushnach.
William Dickson.
Edward S. English.
W. A. Taylor.
Amos Jones.
George F. McKenzie.
Charles H. Hunnewell.
Charles J. Adams.
James F. Jefferds.
John W. Skelley.
Warner W. Simonds.
Thomas D. Cook.
Charles L. Russell.
Benjamin King.
Patrick H. Raymond.
John White.
James I. Murphy.
E. B. Ramsdell.
Michael A. Keenan.
Reuben A. Adams.
George L. Mitchell.
Calvin Ford.
John Lennon.
Thomas J. Stevens.
John R. Fairbairn.
Dennis D. McCarthy.
James E. Murray.
John Good.

Superintendent of Burial-Ground.

Ward I.

Benjamin F. Wyeth.

Undertakers.

Benjamin F. Wyeth.
Roland Litchfield.
Samuel F. Hunt.
Thomas Devens.
John W. Coveney.
Judson Litchfield.
James Kernan.
William Casey.
C. Henry Lockhart.
Alvah A. Hadley.
Benjamin J. Hoyt.
W. A Taylor.
William C. Walker.
James E. Rourke.

Auctioneers.

Samuel R. Knights.
G. C. W. Fuller.
Oliver R. Osborn.
Humphrey L. Snow.
Samuel F. Rugg.
Thomas T. Ferguson.
C. F. Boynton.
John C. Farnham.
Edward Burnham.
George C. Hosmer.
Freeman Baker.
Joseph J. Kelley.
George O. Knox.
Henry A. Burkett.
Enoch H. Wakefield.
Arthur A. Cook.
Frederick A. Lull.
John Good.
A. B. Merrill.
Ira Taylor.
Edmund E. Sanborn.
Benjamin King.
Michael James Moss.
Orrin P. Kinne.
John R. Fairbairn.
Edward H. Carter.
George F. McKenzie.
Samuel C. Knights.
Jeremiah W. Coveney.
James C. Wilder.
T. W. Ray.
John Lennon.
Elias Furbush.
Reuben A. Adams.
Edwin P. Henderson.
Thomas J. Stevens.
John White.
Patrick Phelan.
Calvin Ford.
George H. Wells.
Jason Winnett.

Fence Viewers.

George B. Lothrop.
Abiel Goss.
Abel Stevens.

Field Drivers.

Thomas D. Cook.
James B. Morse.
Micah W. Cook.
Andrew Sproul.
Andrew G. Smith.
George A. Marston.
Benjamin Kennard.
L. J. Cloyes.
James Miller.
William T. Gibson.
Benjamin F. Bridden.
Albert D. Cleveland.
Henry M. Tyler.
Luther Hapgood.
Simon D. Hiscock.
Rufus S. Downe.
Charles B. Jones.
James E. Murray.
John Little.
Calvin C. Smith.
Matthew R. Moore.
Amos Jones.

Daniel Sherman.
James H. Parks.
George Wood.
Warner W. Simonds.
John Coleman.
Thomas S. Hall.
Charles W. Rugg.
William Mullett.
Dennis Corcoran.
Moses W. Hooper.
John F. Murray.
Leonard Shackford.
Daniel Callahan.
William H. Fitzpatrick.
John Le Barron.
Frederic B. Pullen.
David N. McCleary.
Stephen E. Day.
John Collier.
Otis Dennison.
Warren A. Eaton.
Alonzo S. Harriman.
Thomas W. Penney.
Hugh McNamee.
William Evans, jun.
William Nickelson.
Lawrence Ducy.
Michael A. Dalton.
James Daily.
James S. Alexander.
John W. Skelley.
John Jackson.

Measurers of Wood and Bark.

John R. Taylor.
William H. Hood.
Benjamin J. Hoyt.
J. Henry Wyman.
John F. Brine.

Pound Keepers.

James Gilligan.
Thomas D. Cook.
William Twist.

Fish Officers.

Thomas D. Cook.
Walter S. Swan.
Andrew Sproul.

Hay Weighers.

Timothy Sullivan.
William H. Dodge.
Edward Fobes.
John F. Brine.
Elisha H. Tower.

Coal Weighers.

James F. Jefferds.
John F. Brine.
Thomas McIntire.
William A. Hunnewell.
Thomas H. Matthews.
John E. A. Mulliken.
J. Henry Wyman.
Jones Valentine.
Alfred H. Wellington.
Elisha H. Tower.
Herbert T. Lawrence.

Weigher of Boilers and Heavy Machinery.

Elisha H. Tower.

Weighers.

Joseph W. Averill.
Patrick Dunnigan.
James H. Reardon.
Nathan H. Holbrook.
Elisha H. Tower.
Henry Hooker.
Thomas Ralph.
George W. Wright.
Alvin M. Haines.
Henry James.
George W. Barnes.
John Reardon, jun.

Sealer of Weights and Measures.

Stephen P. Sharples.

Inspector of Milk.

Stephen P. Sharples.

Surveyors of Mechanics' Work.

William S. Barbour.
William A. Mason.
John S. Pollard.

Measurer and Surveyor.

E. F. Young.

Inspector of Charcoal Baskets.

Stephen P. Sharples.

Measurer of Grain.

Stephen P. Sharples.

Inspectors of Junk Shops.

George H. Copeland.
Amos Jones.
James E. Murray.
Warner W. Simonds.

Ward Officers.

Ward I.

WARDEN.
Joseph Williams.

CLERK.
John Gorman.

INSPECTORS.
Edmund Miles.
George Allen.
D. J. Hill.

Ward II.

WARDEN.
Harry B. Winnett.

CLERK.
Charles R. Shaw.

INSPECTORS.
James H. Davis.
Charles A. Locke.
Walter Raymond.

Ward III.

WARDEN.
Luther L. Parker.

CLERK.
Andrew Fogg.

INSPECTORS.
James E. Doyle.
Augustus W. Fix.
John A. Donovan.

Ward IV.

WARDEN.
Charles L. Russell.

CLERK.
Robert N. Roaf, jun.

INSPECTORS.
Joshua H. Sanborn.
H. A. Boynton.
E. R. McPherson.

Ward V.

WARDEN.
Francis M. Mason.

CLERK.
Charles L. Fuller.

INSPECTORS.
Henry F. Whitney.
George H. Prior.
Cornelius A. Murphy.

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